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ART. LVI.—OBSERVATIONS ON THE VOLATILE OIL OF BETULA LENTA, AND ON GAULTHERIN, A SUBSTANCE WHICH, BY ITS DECOMPOSITION, YIELDS THAT OIL.

By William Procter, Jr.

In a former communication* the result of a series of experiments on the volatile oil of *Gaultheria procumbens* were presented, which exhibited many of the characters of that substance, showing that it possessed acid properties, and was closely allied to salicylous acid. Since that period M. Cahours has occupied himself with the same subject, and by applying the sure test of ultimate analysis, has arrived at some very interesting results. That chemist has shown† that the oil of Gaultheria has the same composition as the *salicylate of methylene*, (C^{14} H^{5} O^{5} + C^{2} H^{3} O,) and that by distilling a mixture of pyroxylic spirit, salicylic acid, and sulphuric acid, a product is obtained having the properties of that volatile oil, thus exhibiting the first instance of this pyrogenous body (methylene) occuring in a natural production.

* American Jour. Pharm. for Oct. 1842.

† Jour. de Pharm. et de Chem. Mai, 1843.

M. Cahours further observes that the compound resulting from the action of fuming nitric acid on oil of Gaultheria, has the composition of indigotate of methylene, (C^{14} H^4 N O^9 × C^2 H^3 O) and that chlorine and bromine appear to act on that portion of the oil constituting the methylic base. In a subsequent paper* M. C. has given the results of his observations on the ammoniacal compound of oil of Gaultheria, which are full of interest. By distilling that substance he obtained a product having the composition of salicylamid, which under the influence of strong acids and bases, regenerates ammonia and salicylic acid, and has an acid reaction.

When oil of Gaultheria is dropped on finely pulverized caustic baryta, considerable elevation of temperature occurs and a well defined crystalline compound is formed. If the baryta be in great excess, and the mixture be submitted to dry distillation, an oily matter passes over into the recipient, which is but partly soluble in a solution of potash. This substance, when purified by washing with alkaline water and dried over chloride of calcium, has the composition of *anisole*, a substance formed by the action of caustic baryta on crystallized anisic acid.

M. Cahours observes, "although presenting the composition of a neutral ether, the oil of Gaultheria behaves like a true acid. Thus treated with caustic potassa, or soda, it forms crystalline compounds, soluble in water and in alcohol; the addition of an acid separates the oil unchanged; it is only in the course of a day that the whole is converted into salicylic acid." In my experience it has taken a much longer period before the alkaline compounds of oil of Gaultheria would cease to yield that oil on the addition of an acid. Some specimens kept more than twelve months, however, were wholly changed, salicylic acid being precipitated by a dilute acid. In the case of some specimens of the

* Comptes Rendus, July 3d.

compounds of oil of gaultheria and oxide of copper and of baryta, the addition of a dilute acid eliminated the oil apparently unchanged.

Having given an outline of the principal results of M. Cahours, I wish in what follows to call the attention of chemists to the volatile oil of *Betula lenta*. The results of my experiments tend to prove—

1st. The indentity of this volatile oil with the oil of *Gaultheria procumbens* (salicylate of methylene.)

2d. To the existence of a peculiar principle in the bark of the *Betula lenta*, which bears the same kind of relation to the oil of Gaultheria or *Betula lenta*, that amygdaline bears to the oil of bitter almond; and to which I have given the name of *gaultherin*, as it gives rise to the oil of Gaultheria by its decomposition. The term *betulin* (perhaps more appropriate) has been already applied to another substance.

3d. That there exists in the same bark, associated with gaultherin, a substance enjoying the property of reacting with the latter so as to produce the volatile oil, and which is analogous in its mode of operation to synaptase, or emulsin.

The bark of the *Betula lenta* appears to be constituted much like that of the *Cerasus serotina*, (wild cherry.) It contains tannin, gum, saccharine matter, resin in considerable quantity, *gaultherin*, fixed oil soluble in alcohol, &c.

Oil of Betula lenta. The plant which yields this volatile oil is one of the most noble individuals of the American forest, both as to its gigantic size and to the various economical uses to which its wood has been applied in cabinet work, &c. It attains the height of 80 feet; and grows abundantly in the middle and northern States, and in Canada, and is known under the various titles of *sweet birch*, *black birch*, *cherry birch*, and *mountain mahogany*. The bark and leaves are embued with the odor and taste of the *Gaultheria procumbens*, and this similarity in sensible properties sug-

gested the idea of an analogous chemical constitution of their volatile oils.

Twenty-five pounds of the bark taken from the trunk and larger branches, deprived of its external layers, was coarsely bruised, macerated for several days in as much water as would cover it, and then submitted to distillation. By this treatment the bark yielded five drachms of volatile oil, besides that portion which remained in solution in the distilled liquid. Several circumstances interfered with the success of the operation, and it is probable that the amount of oil indicated is less than it might have been under more favorable auspices.

Volatile oil of *Betula lenta*, as obtained by careful distillation, is colorless, has the specific gravity 1.173, and in odor and taste closely resembles oil of Gaultheria. Like that oil, when exposed to the air, it gradually acquires a red color, of which it is easily deprived by distillation. It is also obtained colorless by decomposing its compound with potassa by a dilute acid. It is slightly soluble in water, to which it communicates taste and odor, and mixes in all proportions with alcohol and ether. Its aqueous solution is colored purple by persulphate of iron. Dropped into a concentrated solution of potassa, combination immediately ensues, with the production of a solid compound and the evolution of heat. This product, when pressed between bibulous paper to remove the excess of potassa, and then dissolved in hot alcohol, is obtained in rhombic, and six-sided tables by its evaporation. When one of these crystals is placed in contact with a drop of dilute sulphuric acid, it is at once decomposed, minute globules of oil float on the surface of the liquid, and the odor of the oil is developed. It reacts with caustic soda and baryta, and with oxide of lead and copper, in the same manner as the oil of Gaultheria.

When heated with an excess of potassa, salicylic acid is produced; and when agitated with solution of ammonia, it

is gradually dissolved; the solution depositing crystals in all respects like those from the oil of Gaultheria.

By passing a current of chlorine over the oil of *Betula lenta* it is rapidly absorbed, hydrochloric acid is evolved, and the oil gradually becomes a solid crystalline mass of a yellow color. If this be dissolved in boiling strong alcohol the solution deposits it in brilliant four-sided plates, like the Gaultheria compound, which possesses the same properties.

Bromine combines with the oil, hydrobromic acid being evolved.

By distilling the chlorine compound with iodide, cyanide, or sulphuret of potassium, compounds of the oil with iodine, cyanogen, and sulphur appear to be formed. The latter condenses as a yellow oil, which by standing becomes crystallized, and has a very fetid odor.

Ordinary nitric acid (1.40 sp. gr.) has little action on the oil when cold, but by heat a rapid evolution of red fumes occurs, and the oil is converted into a crystalline matter, having acid properties. It crystallizes in minute prisms, and combines with fixed bases to form salts, which fulminate by placing them on a hot surface. Fuming nitric acid acts unassisted by heat. Both these products appear identical with the corresponding compounds of oil of Gaultheria.

When oil of *Betula lenta* is mixed with concentrated sulphuric acid, but little change occurs, but if heat be applied, the oil is gradually dissolved, the mixture acquires a deep red color, and the odor of the oil ceases to be perceptible. If now it be allowed to stand, the solution becomes a mass of crystals, which after the removal of adhering sulphuric acid, have the properties of salicylic acid. By pressure between bibulous paper and crystalling from a hot solution in water the acid is obtained perfectly pure and white. Oil of Gaultheria yields salicylic acid under the same circumstances. If the acid be in great excess, or too much heat be applied, the operation fails. It is probable that in this re-

action the acid acts on the methylic base of the oil, setting the salicylic acid at liberty. This is an interesting fact and deserves attention.

Gaultherin.—The dry bark of the *Betula lenta* does not possess the peculiar odor of its volatile oil, which latter is only developed by the contact of water. The analogy of this fact to that of the wild cherry bark, rendered it probable that a principle existed in the bark, which by its decomposition, yielded the oil. When the powdered bark is treated with cold alcohol of 95 per cent. by maceration and displacement, until it is exhausted, the residue of the bark no longer gives an odor of Gaultheria when moistened with water. If the alcoholic liquid be evaporated to an extract, and a portion of it be mixed with a part of the exhausted bark in water, the peculiar odor of the volatile oil is immediately developed, and by distillation a liquid is obtained which is colored purple by the persulphate of iron, and otherwise reacts like the oil of *Betula lenta.*

Gaultherin does not appear to exist in the *Gaultheria procumbens.* The leaves of that plant were dried, powdered, and treated like the bark of *Betula lenta*, but they did not yield that principle. The leaves of the Gaultheria, when long kept, lose their odor, and mixture with water does not revive it, as with *Betula lenta;* hence it would seem that the salicylate of methylene is an immediate product in the *Gaultheria procumbens,* whilst in the *Betula lenta* it is secondary.

In order to obtain this principle as pure as possible, the alcoholic extract of the bark is treated with water, which leaves the resin and fixed oil. The dark red liquid thus obtained, containing tannin, extractive, and saccharine matter, is then treated with an excess of hydrated protoxide of lead, until these substances are separated, and the transparent, nearly colorless liquid obtained by filtration, is carefully evaporated. A transparent gummy mass results, which almost wholly dissolves in alcohol of 97 per cent. The alcoholic solution,

by spontaneous evaporation, yields a syrupy, almost colorless product, which does not crystallize after standing several weeks. In this state it is evidently associated with some substance that prevents its crystallization. The syrupy liquid was agitated with several times its bulk of ether, but the former separated from the mixture unchanged. The difficulty of combining gaultherin with other bodies opposes a barrier to its examination.

As thus obtained gaultherin has little, if any, odor, and a slightly bitter taste. When heated carefully on a plate of glass until all the moisture has evaporated, it remains as a transparent varnish-like layer easily pulverizable. When held in a flame it takes fire and burns tardily, with a large carbonaceous residue, and may be heated to 300° Fahr., without change; at 350° it froths and becomes darker colored, and at 400° it becomes almost black, and emits empyreumatic vapors. At the two first mentioned temperatures the composition and properties of gaultherin do not appear to be affected, but at the latter they are almost entirely destroyed. Subjected to heat in a close tube, gaultherin is completely decomposed; a yellow oil condenses on the opposite end of the tube, which possesses the properties of oil of Gaultheria, but is contaminated with pyrogenous matter; whilst a carbonaceous residue remains.

When gaultherin is mixed with concentrated sulphuric acid it is dissolved, the acid acquires an intensely red color, and the odor of the oil of *Betula lenta* is developed.

If gaultherin be distilled with diluted sulphuric acid, it is decomposed, and the distilled liquid is strongly impregnated with the oil, globules of which float upon its surface.

Distillation with dilute hydrochloric acid also generates the volatile oil.

When gaultherin is dissolved in dilute nitric acid, (sp. gr. 1.04,) and the mixture distilled, the liquid in the recipient contains no volatile oil; but floating on its surface and attached to the sides of the receiver, are numerous acicular

crystals of a pale yellow color. This substance forms a yellow solution with alcohol, which by evaporation leaves it in minute crystals of a yellow color. This substance is probably formed by the reaction in the receiver, between the nitric acid vapour and that of the volatile oil, (which is doubtless generated.) It has an acid reaction, and appears analogous to the compound formed from the oil by nitric acid. When gaultherin is mixed with fuming nitric acid and gently heated, a rapid reaction takes place, nitrous acid vapours are evolved, and a yellow solution results, which by mixture with water and standing, deposits a crop of yellowish white prismatic crystals.

The fixed alkalies and alkaline earths have a remarkable action on gaultherin, wholly destroying its power of generating volatile oil, and converting it into an acid which remains combined with the base. When gaultherin is boiled with a solution of ammonia until the odor of the latter ceases to be perceptible, the gaultherin appears to be but slightly acted on, as it reacts with the residue of the bark, producing the volatile oil.

If gaultherin be boiled for some time with hydrated protoxide of lead in water, and the solution filtered, it is found to contain lead and reacts alkaline. By adding sulphuric acid, carefully avoiding an excess, the liquid filtered from the sulphate of lead is acid, and does not contain sulphuric acid. But a small part of the gaultherin is decomposed.

The process of Piria for combining salicin with oxide of lead was tried with gaultherin, by rendering a solution of the latter alkaline with ammonia, and adding subacetate of lead. The gaultherin was thrown down in combination with the oxide of lead, but it appears to be either converted into gaultheric acid, or otherwise decomposed, as neither the liquid filtered from the precipitate, or that obtained by decomposing the precipitate with dilute sulphuric acid, would yield the volatile oil when mixed with the residue of the bark.

Gaultheric acid.—This acid is obtained by dissolving gaultherin in baryta water, boiling the solution for a short time, and afterwards passing a current of carbonic acid through the liquid until all the free baryta is removed, and filtering. A neutral solution of gaultherate of baryta is then obtained, from which the gaultheric acid may be isolated by cautiously adding dilute sulphuric acid as long as a precipitate is produced. The filtered liquid acts strongly acid on litmus, and does not precipitate baryta water. By evaporation it attains a thick syrupy consistence, and dries into a gum-like mass. In this form it is impure. By boiling it with carbonate of lead until saturated, filtering the solution, and then precipitating the lead with hydrosulphuric acid, a solution is obtained containing the acid in a much purer state, which by evaporation yields it in a nearly colorless mass, with some evidence of crystallization.

Gaultheric acid is soluble in water and alcohol, but is only slightly taken up by ether. It saturates acids, forming neutral salts which do not crystallize.

By distilling it with dilute sulphuric acid, oil of Gaultheria is obtained, and nitric acid appears to act on it like gaultherin.

The substance existing in the residue of the bark, after exhaustion by alcohol, and which reacts with gaultherin to produce the volatile oil, has not been isolated. It is insoluble in water, as by long maceration in that fluid it is not removed or changed. The temperature of ebullition entirely destroys its power of acting on gaultherin, which proves its analogy to synaptase. Maceration in solution of potassa, sp. gr. 1.05, also destroys its power. The impossibility of finding a menstruum capable of dissolving this principle, has prevented a further examination of its properties.

In the foregoing observations, some interesting facts have been elicited. The existence of a chemical compound of so extraordinary a nature as the salicylate of methylene in a

diminutive individual of the heath tribe, was indeed striking: now we have the same complex substance pervading the bark, leaves, &c. of one of the largest of our forest trees. Additional interest attaches to the latter because of a principle of a still more complex nature that exists in it, and which contains the elements of the salicylate of methylene; thus adding another to that class of neutral substances, of which amygdaline is the type.

It will be interesting to know the ultimate composition of this principle, and the relation it bears to gaultheric acid and to salicylate of methylene. Before that can be accomplished, the necessity of obtaining it in a pure state is imperative. The more important of the observations contained in this paper were made during the past spring and summer; but till recently the author has not had sufficient leisure to arrange them for publication. It is hoped that the attention of chemists will be attracted to these principles, and their character more fully developed.

Dec. 20th, 1843.

ART. LVII.—ON AN ARTICLE CALLED TEXAS SARSAPARILLA.

(*Read at the Pharmaceutical Meeting, Nov.* 6, 1843.)

By J. Carson, M. D.

Some time since there was brought to Philadelphia, and presented to the trade, an article entitled *Texas Sarsaparilla.* The lot in the hands of the importer was of sufficient size to render it an object to dispose of it; but the attempt, so far as we were enabled to learn, was not successful. As the article bore no resemblance to genuine sarsaparilla, the effort to substitute it for this valuable drug must have originated in great ignorance, or else in speculation of an extremely suspicious nature. From the specimen obtained at the time, I shall give such a description of it as will enable it to be recognized, should it again make its appearance. The packages have been made to resemble those of the genuine, about a foot and a half in length, and half a foot or more in diamater; composed of long branching stems, doubled twice or thrice upon themselves, without any attachment to a head. The lower portion of the stems is as thick as a large sized quill, rough, wrinkled longitudinally, and of a dirty brown color, the upper extremity thin, smooth, and light-brown; at irregular intervals of their length, are protuberances from which lateral branches appear to have been separated, and along the entire surface of the older and lower portions are minute fibrillæ, here and there collected in small tufts. The structure of this article is evidently *cauline*, consisting of a delicate epidermis, and a thin woody layer, very tough and fibrous, enclosing medulla. The entire substance may be crushed, but cannot without difficulty be broken transversely. To powder it is impossible. It has no odor.

The taste is very bitter and disagreeable. To one who is familiar with the structure of plants, it is at once evident that the article under consideration is composed of the stems of some climbing, twining plant, possessed of the habit of the *Rhus radicans*, which has been collected and prepared in the way described, to resemble sarsaparilla. As it is stated to come from Texas, it most probably has been collected in the forests of that country.

ART. LVIII.—SOME ACCOUNT OF GUNJAH, OR INDIAN HEMP AND ITS PREPARATIONS.

By Augustine Duhamel.

(*Read at the Pharmaceutical Meeting, November* 6, 1843.)

Cannabis Indica—Indian Hemp.

Botanical Description.—Cannabis Sativa. Lindley's Flora Medica, p. 299. This plant, considered identical with the *Indica*, is dioicious, annual, about three feet high, covered over with a fine pubescence : stem erect, branched, bright-green, angular : leaves, alternate or opposite, on long weak petioles ; digitate, scabrous, with linear, lanceolate, sharply serrated leaflets, tapering into a long smooth entire point ; stipules subulate ; clusters of flowers axillary with subulate bractes ; males lax and drooping, branched and leafless at base ; females erect, simple and leafy at the base. Calyx downy, five-parted, imbricated; stamens five ; anthers large and pendulous. Calyx covered with brown glands. Ovary roundish, with pendulous ovule, and two

long filiform glandular stigmas; achenium ovate, one-seeded. The fibres of the stems are long and extremely tenacious, so as to afford the best tissue for cordage. The seed is simply albuminous and oily, without narcotic properties.

For the knowledge we possess of this active remedy we are indebted to the interesting contributions of Dr. W. B. O'Shaughnessy, to the London "Provincial Medical Journal." To him is due the credit of introducing it to the medical public as a valuable therapeutic agent.

The narcotic effects of hemp are popularly known in the South of Africa, South America, Turkey, Egypt, Asia Minor, India, and the adjacent territories of the Malays, Burmese and Siamese. In all these countries hemp is used in various forms by the dissipated and depraved, as the ready agent of a pleasing intoxication. As the popular medicine of these nations it is employed in a multitude of affections. But in Western Europe its use as a stimulant or as a remedy, are alike unknown. Much difference of opinion exists on the question, whether the hemp, so abundant in Europe, even in high northern latitudes, is identical in specific characters with the hemp of Asia Minor, and India. The extraordinary symptoms produced by the latter, depend on a resinous secretion with which it abounds and which seems totally absent in the European kind. The closest physical resemblance exists between both plants; difference of climate seems more than sufficient to account for the absence of the resinous secretion and consequent want of narcotic power in that indigenous in colder countries. The Indian Hemp of the United States, *Apocinum cannabinum*, bears no resemblance to the hemp of India, and should not be confounded with it.

Physical and Chemical Properties.—In certain seasons and in warm countries, a resinous juice exudes or concretes on the leaves, slender stems and flowers. Separate and in masses it constitutes the *churrus* of Nipal and Hindostan

and to this the type or basis of all the hemp preparations are the powers of these drugs attributable. *Churrus* is collected in central India and the Saugor territory, and in Nipal during the hot season as follows: Men clad in leathern dresses, run through the hemp fields, brushing through the plant with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off, to be formed into little balls. A finer kind collected by the hand in Nipal is sold at a greater price. It is also collected in Nipal upon the skin of naked coolies. In Persia it is prepared by pressing the resinous plant on coarse cloths, and then scraping it from these and melting it in a pot with a little warm water.

The resin of the hemp is soluble in alcohol and in ether; partially soluble in alkaline, insoluble in acid solutions; when pure, of a blackish grey color; hard at 90°; softens at higher temperatures and fuses readily; soluble in the fixed, and several of the volatile oils. Its odor is fragrant and narcotic; taste, slightly warm, bitterish and acrid.

The dried hemp plant which has flowered, *and from which the resin has not been removed*, is call *Gunjah*.

The bundles of *gunjah* are about two feet long and four inches in diameter, and contain twenty-four plants. The color is dusky green; the odor agreeably narcotic; the whole plant resinous and adhesive to the touch. It is chiefly used for smoking. The *gunjah* consumed in Bengal is chiefly brought from Mirzapür and Ghazeepore, being extensively cultivated near Gwalior and in Tirhoot. The natives cut the plant when in flower, allow it to dry for three days, and then lay it in bundles, averaging two pounds weight each, which are distributed to the licensed dealers. *Gunjah* yields to alcohol 20 per cent. of resinous extract, composed of the resin (churrus) and green coloring matter, (chlorophylle.) Distilled with a large quantity of water, traces of essential oil pass over, and the distilled liquor has the powerful narcotic odor of the plant.

The preparations of Indian hemp are used by the natives

for the purpose of intoxication. In this intention they prepare a mixture of powdered *gunjah*, various condiments and milk which they drink as a certain intoxicating beverage. Powders composed of gunjah and tobacco, for smoking in a pipe are variously prepared to produce an intoxicating delirium. The intoxication lasts for three hours when sleep supervenes. No nausea or sickness of the stomach succeeds, nor are the bowels at all affected; next day there is slight giddiness, and much vascularity of the eyes, but no other symptoms worth recording. It is said to be very fascinating in its effects, the intoxication being of a cheerful character, producing extatic happiness, a persuasion of high rank, a sensation of flying, voracious appetite, and intense aphrodisiac desire. The remarkable qualities of this drug were known to the Arabian and Persian physicians, both ancient and modern: but Dr. O'Shaughnessy could no where find any account of its administration as a remedy, of its dose, or of its exact therapeutic effects. His first step, therefore, was to institute an extensive series of experiments with it upon animals. The carnivorous animals speedily exhibited the intoxicating influence of the drug, while the graminivorous experienced but trivial effects from any dose administered. In none of these, on several other experiments, was there any indication of pain or convulsive movement. The results forced conviction upon his mind, that the resin of hemp could be used with the greatest utility upon the human subject.

Its properties are sedative and narcotic. Dr. O. S. found its chief value as an anti-convulsive remedy, in tetanus, hydrophobia and cholera.

It is used in the form of extract and tincture.

A formula is given in the London Pharmaceutical Transactions, by Mr. Savary, for the preparation of the extract, as follows:

Gunjah, finely bruised,	4lb. avoirdupois,
Rectified spirit, (0.838,)	5 galls. O. M.

Macerate the gunjah, in two gallons of the spirit, for seven days, then strain off, and add one gallon more of the spirit: let this stand four days and strain ; mix the two tinctures and filter ; then boil the hemp in the remaining two gallons of spirit, for fifteen minutes and filter whilst hot. Let all the mixtures be united, then distil off the spirit, and evaporate the remainder in a water bath, to the consistence of an extract, (product 12 oz.)

The *tincture* is prepared by dissolving three grains of the extract in one drachm of proof spirit.

Dose—From one to ten, or even twenty grains. Small doses are recommended to commence with.

ART. LIX.—REPORT ON A ROOT FOUND IN SENEGA.

Read at the Pharmaceutical Meeting, November 6, 1843.

The Committee having in charge the investigation of an article introduced into the market, associated with Senega to an extent of 33 per cent., and calculated, from its resemblance in some of its external characters to the genuine root, to deceive, beg leave to Report as follows:—

This adulteration separated from the Senega, is in long, slender, tapering roots, terminating in a knotty head, to which are attached numerous small fibres. It is branched and tortuous like Senega. The epidermis is corrugated, transversely cracked, and of a reddish brown color: it is also friable, and possesses a strong bitter taste; is entirely without acridity, and has no smell. The central portion is ligneous, reddish white, and tasteless. As all the Polygalæ have a more or less acrid taste, this cannot be one of them,

but its sensible properties and characters are the same as those of the root of the *Gillenia trifoliata.* By comparing it with the specimens of the latter contained in the cabinet of the College, their identity is placed almost beyond a doubt, and the fact that the Gillenia grows in the same localities as Senega is further evidence.

Your Committee have made diligent inquiry among the wholesale drug dealers, but have been unable to trace its origin.

From the house whence issued, the only information elicited was that it was obtained at a public sale, at a time when they were short of their usual supply. Your Committee believing that the main object (that of directing attention to its existence,) is now fulfilled, ask to be discharged.

AUGUSTINE DUHAMEL,
WILLIAM PROCTER, JR.

ART. LX.—NOTE ON ERGOTIN.

By Augustine Duhamel.

Read at the Pharmaceutical Meeting, November 6th, 1843.

The accompanying specimen of a substance termed *Ergotin* is submitted to the inspection of the Society, as the product of an experiment upon Mr. Bonjean's process, published in the last number of our Journal. A few remarks are at the same time offered, as serving to fill up the void occasioned by the want of details in Mr. B.'s directions for obtaining this substance. The occasion is also seized upon to bring in contrast two substances of opposite character, to both of which the same name has been assigned. The term *Ergotin* has been applied to two different principles contained in the Ergot; one supposed to possess all the poisonous properties,—the other, the anti-hemorrhagic action of that article.

It was first given by Mr. Wiggers (see Chemical researches upon Ergot, published in the *Annales de Pharmacie*, Vol. i., 1831) to a red powder obtained from Ergot finely reduced, and previously exhausted of its fixed oil by ether; by the action of boiling alcohol, and evaporation to the consistence of an extract; this extract, which is of a reddish-brown color and granulated, is then treated with water, which separates the soluble and larger part, leaving behind the insoluble portion. This last, the *Ergotin*, exhibits the following characters:—"It gives a reddish-brown powder of a peculiar nauseous odor, developed more particularly by heat; bitter taste and a slight acridity. It is neither acid nor alkaline; is insoluble in water and ether, but readily soluble in alcohol, furnishing a reddish-brown solution, and giving rise to a cloud of the same color by the addition of water; is discolored by chlorine, and dissolved by caustic

potash, as also by acetic acid. Heated with nitric acid, it is destroyed. It is not melted by heat, but soon burns, giving out a peculiar odor."

Mr. Wiggers further observes:—To this substance Ergot would appear to owe all the energy of its action. That all its noxious effects are due to it is proved by the physiological experiments undertaken with Ergotin. But the medicinal effects, however, of Ergot can hardly be attributed to it, since these virtues, according to many physicians, reside in the aqueous decoction, whilst Ergotin is insoluble in water.

The *Ergotin* of *Bonjean* (Jour de Pharm. et de Chim. vol. iv., 1843) is obtained from powdered Ergot by the displacement method, by the immediate action of cold water, and concentration of the product, in a water bath, to a syrupy consistence; this is then treated with alcohol to separate the albuminous matters, and the clear tincture reduced to an extract. In pursuing Mr. B.'s directions, it becomes necessary to mix the powdered Ergot with a quantity of sand, and to act upon a moderate portion only at a time. The large quantity of fatty matter, gummous, extractive, and vegetable albumen contained in the Ergot, presents an obstacle to the free and rapid percolation of the aqueous menstruum; so much so, that if a large quantity be acted upon, the putrefactive fermentation takes place before the filtration is far advanced.

This *Ergotin* is a soft extract, which does not dry, being decomposed at an elevated temperature; its color is reddish-brown; odor, that of ozmazome; taste, slightly bitter and peculiar; is insoluble in ether, but readily dissolved in alcohol and in water, forming a transparent solution, which is slightly acid. Heated, it melts, burns with flame, developing the odor of burnt bread, leaving a charcoal which burns almost without residuum.

Precisely the same characters are ascribed by Wiggers to one of the principles of Ergot isolated by him, which he distinguishes by the name of *vegetable ozmazome*, being

essentially an extract of that larger portion characterized by him as soluble in water in the process of forming *his* Ergotin.

Mr. Bonjean considers his Ergotin a specific against hemorrhage in general, and as possessing this advantage over Ergot, that being utterly freed from the poison which this last contains, the dose may be increased at will, without fear of those accidents which result from the use of the grain itself.

ART. LXI.—EXTRACT FROM MR. DESCHAMP'S MEMOIR UPON POMMADES.

Mr. D. remarks as follows:—

Struck with the very slight alteration which Poplar Ointment undergoes, I thought its preservation was owing to the resinous matter which the grease drew from the poplar buds; hence it occurred to me that the portion of benzoin soluble in grease, would likewise prevent its alteration, and an agreeably aromatized ointment be obtained. These ointments were prepared as follows:—

Benzoin in coarse powder, - -	120.00 grms.
Melted lard, - - - -	3000.00 "

Heat in a water bath for two or three hours, strain without expression, and stir from time to time while it is cooling:

Poplar buds, - - - - -	500.00 grms.
Melted lard, - - - -	3000.00 "
Water, - - - - -	250.00 "

Heat in a tinned vessel until all the water is driven off, then pass through linen, and stir until it becomes cool.

After having proved that these ointments, which I have called *Benzoated and Populinated grease*, did not after several years offer any change in odor, I sought by means of proper re-agents to discover if this observation was confirmed, and to discern the difference between the prepared grease and ordinary fat bodies. I knew that red oxide of mercury was changed by the common fatty substances. I was aware of the readiness with which fatty bodies acidified when either the acetate or subacetate of lead was mixed with them. I perceived that the Iodide of Potassium might serve in the promptest manner to discover rancidity or acidity in fatty bodies, and I arrived at this conclusion by the aid of experiments, useless to detail here since the results are exhibited in the formulas which I propose—that the fatty bodies the least alterable are the *benzoated* and *populinated* greases, and immediately after follows butter melted with caution.

That the *populinated* grease, by reason of the coloring matter it takes from the buds, becomes orange colored by the agency of alkalines contained therein, or substances having similar action. That this change is limited to the coloring matter is proved by subacetate of lead, which after a very long time merely colors it without changing its normal odor.

The following Ointments may be prepared:—

OINTMENT OF IODIDE OF POTASSIUM.

Iodide of potassium, - - -	4.00 grms.
Water, - - - - - -	4 00 "
Benzoated grease, - - -	30.00 "

This ointment may likewise be prepared with populinated grease or with butter. Six months witnesses no change in this preparation.

OINTMENT OF RED OXIDE OF MERCURY.

(Pommade de Lyon.)

Red oxide of Mercury, - -	2.00 grms.
Benzoated grease, - - - -	32.00 "
Ess. oil of roses, - - - - -	2 drops.

This may also be prepared with butter, but it does not keep so well as when prepared with Benzoated grease.

MERCURIAL OINTMENT.

Eleven months have transpired since the preparation of this ointment with the populinated grease, and it is not rancid.

Lip Salve as commonly made, soon becomes rancid, loses color, and granulation ensues. Made by the following formula, it does not become rancid, or produce any disagreeable impression upon the lips.

Populinated grease, - - -	120.00 grms.
Newly melted suet, or populinated suet, - - - - -	40.00 "
Alkanet, - - - - - -	8.00 "

Place the whole in a tinned skillet, heat at a low temperature, pass through linen, and aromatize with

Ess. oil of roses, - - - -	10 drops.

Mix and cool quickly, stirring in the mean time.

From the exposition of these facts it results:—

That the ointment of iodid. potassii can only be prepared with benzoated or populinated grease, or else butter.

That the ointment of red oxide of mercury and mercurial ointment, made with the grease thus prepared, may be kept a year without any sign of rancidity.

That the benzoated grease, by reason of its whiteness, should be preferred when the ointments are intended to be

white, or when any substance enters into their composition having an alkaline reaction.

That the benzoated and populinated greases are preferable to other fatty bodies, and that the latter resists oxidation better than any other fatty body.—*From the Journal de Pharmcie et Chimie.*

A. D.

ART. LXII.—THE PLANT PRODUCING GUM AMMONIAC.

By A. Richard.

In a magnificent work, *Illustrations of Plants of the East*, of which six livraisons have hitherto appeared in small folio, each containing ten plates, Messieurs Jaubert and Spach have described and figured, under the name of *Diserneston gummiferum*, (p. 70 to 40,) a large umbelliferous plant, found in Persia by the intrepid traveller, Aucher Eloy, and which there produces gum ammoniac. The characters assigned to this plant, of which the authors have thought that they ought to form a new genus, under the name of Diserneston, have convinced us that it is not new, as has been supposed by them. It appears to us to be the same as that already described by Mr. Don, several years ago, (Philos. Mag.) under the name of *Dorema ammoniacum*, and of which we published a very full description in the third edition of our Histoire Naturelle Medicale. For those who compare the characters that Messrs. Jaubert and Spach have given of their *Diserneston gummiferum*, it will be easy to recognize the same plant that Mr. Don has named *Dorema ammoniacum*. In fact it is a plant of which the bipinnate leaves, with very large folioles, confluent at base, re-

semble those of the *Pastinaca opponax*. The flowers have a very remarkable character; they form small umbellets, almost globose, borne upon a very short peduncle. These umbellets, instead of being united in umbels, form a kind of simple bunches, which by their reunion constitute compound bunches or a panicle. The calycine limb is prominent, and constitutes a sort of cup at the summit of the ovary; this last is covered with silky hair. Finally, the fruit is compressed and presents striæ little prominent, to the number of 3 to 5 on each face. The different characters that we have stated are common to both plants mentioned, and prove their identity.

It results from the preceding observations, that the name *Diserneston gummiferum* ought to be appended as a synonym to that of *Dorema ammoniacum*, given previously by Mr. Don, to the umbelliferous plant, which in Persia furnishes gum ammoniac by exudation. Messrs. Jaubert and Spach have, nevertheless, done an important service to Medical Natural History, by making us better acquainted with this vegetable, of which they have published an excellent description and figure.

Jour. de Chemie Med.

ART. LXIII.—ON THE MALAMBO, OR MATIAS BARK.

By Alexander Ure, Esq.

Surgeon to the Western Ophthalmic Institution, &c.

A quantity of the bark of a tree, said to have come from Colombia, in South America, was sometime since placed in my hands by Hugh Houston, Esq., that gentleman having received it from Dr. Mackay, who communicated two papers respecting it, under the name of Matias Bark, to the British Association. He there mentions his having procured from it, by distillation, two oils, one lighter than water, of specific gravity 0.949; the other denser, of specific gravity 1.028. He further obtained a brown extractive substance of an intensely bitter taste. Dr. Mackay remarked, that it had been successfully administered in intermittent fever, in convalescence from continued fever, in hemicrania, dyspepsia, and in a variety of chronic ailments, where tonics and stimulants were indicated; and that as an adjunct to diuretic remedies, it had been found eminently useful.

The so-called Matias bark is from three to four lines thick; brittle, though somewhat fibrous; emitting, when fresh bruised, an aromatic hue, not unlike that of acorus calamus. It is of a brown hue, covered with an ash-coloured tuberculous epiderm. It possesses a bitter pungent taste. With water it forms an agreeable bitter infusion; with alcohol a powerful bitter tincture. Ether extracts from it volatile oil and resin. Heated along with hydrate of potash, free ammonia is disengaged, indicating the presence of an azotized principle. It is without astringency.

It appears to coincide, as suggested to me by M. Guibourt, both in regard to physical and sensible qualities, with Malambo, the Indian name for the bark of a tree which grows

in New Granada, and which is held in high esteem among the natives as a febrifuge and stomachic.

Malambo bark was analyzed by M. Cadet Gassicourt, about twenty-eight years ago (*Journ. de Pharmacie*, tom. ii. p. 172); subsequently, by M. Vauquelin, who ascertained the presence of three distinct substances: namely, 1. An aromatic volatile oil. 2. A very bitter resin. 3. An extract, soluble in water, which yeilded ammonia, when heated with caustic potash (*Annales de Chimie*, tom. xcvi. p. 113). It afforded no tannin, scarcely a trace of gallic acid, and none of the alkalis of cinchona. It is stated, that in the countries where the tree is indigenous, incisions are made in the bark, and there exudes an aromatic oil which sinks in water. Most authors believe it to be the produce of a species of *drimys;* but M. Bonpland regards it as a *quassia* (*Merat et de Lens, Dictionnaire de Mat. Med.*, tome iv., p. 199.) This, however, is improbable, since none of the quassia tribe yet discovered are possessed of aroma.

The above Colombian bark has been frequently administered by me as a substitute for cinchona with good effect. It offers the useful combination of a tonic and aromatic; and seems to exercise its beneficial influence on the principle laid down by Professor Schultz, with regard to other therapeutic agents of the same class, namely, in promoting an increased flow of bile, whereby digestion is perfected, and healthy blood formed. In scrofulous ophthalmia, after removing feculent accumulations from the bowels, I have known an infusion, made with two drachms of the bark to a pint of water, cause a speedy and complete removal of the inflammation and morbid sensibility of the eyes. The dose of the infusion just mentioned is from one to two ounces, repeated twice or thrice in the course of the day. It may, in some instances, be advantageously conjoined with salts of iron, or of mercury, with both of which it is compatible. The addition of a little syrup of orange-peel, and compound tincture of cardamom forms a draught by no means disagreeable. *Pharm. Journ.*

ART. LXIV.—ON THE NATURE AND PROPERTIES OF A LIQUID SOLD UNDER THE NAME OF TER-CHLORIDE OF CARBON.

By Alexander Ure, Esq.

In the London Lancet of July 15, 1843, is a paper by E. W. Tuson, Esq., F. R. S., Surgeon to the Middlesex Hospital, "On the Effect of the Ter-Chloride of Carbon." That gentleman states its having proved beneficial in relieving the pain, and destroying the fetor of the discharge, of cancerous sores, besides producing other peculiar effects of an advantageous nature. He further extols its employment in cases of senile gangrene, sloughing ulcer, uterine and neuralgic affections, and in some instances of severe sickness after the usual remedies had failed. "It allays nervous irritability, removes anxiety of mind, invigorates and raises the spirits, and where patients have one day been in a state of complete misery, they have on the following one become happy and joyful from its effects."

"The ter-chloride of carbon," continues Mr. Tuson, "is a clear transparent fluid, smelling strongly of chlorine, as its name implies; it consists of three parts of chlorine and one of carbon, the dose from one to four drops in water, two or three times a day; one to two drachms to a pint of water as an injection or lotion."

Not being acquainted with any *ter-chloride* having the composition above assigned, or of any mere compound of chlorine and carbon, which is soluble in water, I was induced for information to refer to the work of Berzelius. In vol. i. p. 131, of the Brussels edition, we find described:—

1. A combination of one atom of carbon with three atoms of chlorine. This is a solid substance devoid of color or taste. Its specific gravity is nearly twice that of water. It enters into fusion at 320°, and boils at 356° Fahr. It does

not dissolve in water, either cold or hot, but is soluble in alcohol, and still more so in ether. These solutions are not affected by nitrate of silver.

2. A compound of one volume of carbon and two volumes of chlorine. Its specific gravity is 1.5526. Although liquid, it is *insoluble* in water.

3. A combination of equal volumes of chlorine and carbon. It occurs as a sublimate. It too is *insoluble* in water.

In order to ascertain the properties of the liquid referred to in Mr. Tuson's paper, I sent for a small quantity of the so-called ter-chloride. It possessed an ethereous character, mixed freely with water having a specific gravity of 0.882, boiling at a temperature of 170° Fahr., exhibiting an acid reaction with moist litmus paper, and affording a white precipitate on the addition of nitrate of silver. It is, therefore, totally different from any of the compounds heretofore described as chlorides of carbon, but bears a strong resemblance to what is sometimes termed chloric ether, a preparation which has, I believe, been for years usefully employed as an agreeable internal stimulant.

With the view of testing the topical efficacy of the preparation in question, I tried it in three cases; but regret to state, that the results obtained were by no means encouraging. Upon the 2d of August last, I prescribed for a patient, laboring under ulcerated cancer of the tongue, a lotion composed of one drachm to a pint of water. Here it produced no benefit beyond that of a simple detergent. The patient died after suffering excruciating agony at the end of the month.

Upon the 12th of August I ordered a similar lotion, in the hope of procuring some sedative effect in the instance of a gentleman under my care, who for several years past has been afflicted with extensive and obstinate erosive ulceration of the skin surrounding the throat, and which is accompanied with most distressing itching and irritation. Under its use, however, the whole throat became perfectly raw, the dis-

charge copious, and his sufferings from soreness and itching were extreme, so that after persevering steadily for three days, he was obliged to give it up.

About the same period, I was consulted by my friend Mr. French, of Great Marlborough Street, respecting a patient of his who had a cancerous sore upon the right leg. Here I advised a trial of the above lotion; but after applying it assiduously during three consecutive weeks, no improvement could be perceived. *Ibid.*

ART. LXV.—NOTICE OF THE METHOD OF DETECTING ARSENIC BY MEANS OF COPPER, PROPOSED BY M. HUGO-REINSCH.

By Louis-Victor Adouard of Beziers.

In the number of the "*Journal de Chimie Medicale*" for January, 1843, M. Hugo-Reinsch proposes a new method for detecting arsenic, which he assures us rivals in sensibility the process of Marsh. To convince myself of this fact, the following experiments were undertaken.

Dr. Guy had employed with success at Beziers, Fowler's arsenical solution in certain eruptions. A smith, aged 30 years, by the advice of his physician, took this solution for several days, commencing with two drops morning and evening, and increasing to twelve.

I requested the smith to send me the urine which passed at night and morning, or after each dose of the arsenical solution. I received in a bottle 1200 grammes of urine, perfectly limpid, and slightly acid.

This I divided into two parts; one part was treated by Orfila's process—viz. incineration with nitrate of potassa.

This afforded a solution, which gave by Marsh's process an arsenical ring in a glass tube, and spots of the same nature on porcelain; pure materials being used in the process.

On the other hand, the second part of the urine was treated as proposed by M. Reinsch. The liquid was placed in a porcelain capsule, and reduced by evaporation to one-third; on repose, a considerable deposit was formed. To this liquid 200 grammes of pure hydrochloric acid was added; the deposit was immediately dissolved, and the liquid became of a deep brownish red color. Heating the liquid to ebullition, two plates of copper, perfectly clean, were placed in it, and retained for ten minutes. This being without effect, boiling was continued for half an hour, but with a similar result. The plates withdrawn from solution, washed and dried as directed by M. Reinsch, were not covered with a coating of an *iron gray* color; they were brownish, from a coating of brown oxide. One of the plates introduced into a glass tube, and heated, did not yield the least trace of arsenious acid.

These experiments appear to demonstrate, in opposition to the assertions of M. Reinsch, that this method does not rival in delicacy that of incineration by nitrate of potassa, or probably that of carbonization by sulphuric acid, although loss is sustained in both these latter operations.

M. Reinsch asserts, that the method by copper, will detect the millionth of 0.050, equal to the 20,000th of 0.001 of arsenious acid. Many experiments made, in which different quantities of arsenious acid had been added to urine, soup, water, &c. enabled me to perceive very distinctly, on the copper, the *iron gray* color, and to obtain afterwards, in a tube, appreciable quantities of arsenious acid, but only when about six-twentieths of 0.001 of the acid was added to the liquid; or the great diversity of six-twentieths, instead of the twenty thousandth of a millegramme.

I may add, that the method of M. Reinsch, has the serious inconvenience of introducing a salt of copper into the

liquid operated on. To confirm this, it is only necessary to evaporate to dryness the liquor treated by copper and hydrochloric acid; calcine the residue, and dissolve in nitric acid, and a considerable amount of distilled water. A solution will be obtained, which will readily demonstrate the presence of copper, by means of ammonia, clean iron, and ferrocyanide of potassium.

Journ. de Chim. Med.

ART. LXVI.—PRACTICAL OBSERVATIONS ON LEAD PLASTER.

By DAVALLON,

Professor in the School of Medicine and Pharmacy, at Lyons.

THE great consumption of lead plaster has led to considerable attention to practical modifications in the process of its manufacture.

In the *Journal de Pharmacie de Midi*, my friend M. E. Manchon, has published some interesting details on this point; but his conclusions are in opposition to the observations which I have made on this preparation.

The principal constituents are lard, olive oil, litharge, and more or less water; this latter serving not only as a water bath to prevent too great a rise of temperature, but also to favor the reaction between the oxide of lead and the oil.

On consulting the older works on pharmacy, it will be perceived that the precise amount of water is not determined, but all agree in separating as much as possible all which remains in the plaster without being combined.

Lemery, among others, explains the process in the *Pharmacopée Universelle*, as follows :—

"If the quantity of the decoction prescribed does not suffice to finish the preparation of the plaster, more must be used; but none must remain, for the moisture would prevent the plaster from being of good consistence, and consequently not adhesive: that is to say, not spreading well on leather or cloth.

"If then the plaster still boils, although solid and cooked, it is a sign that some of the decoction yet remains; this is to be evaporated, and then the plaster retained for half an hour at a gentle heat, continually stirring with a wooden spatula, so as to render it dry and more adhesive."

I had not attended to this observation of Lemery, when accident led me to recognize its correctness. On preparing the simple plaster in the laboratory, it wanted but a few minutes of being finished, but the water was deficient, and the temperature rose, some portions were decomposed, communicating a brown tinge to the mass, but not sufficient to prevent its employment. This plaster when spread on cloth possessed (whiteness apart) all the properties of an adhesive plaster, viz. suppleness, brilliant aspect, and above all, the advantage of keeping for a long time without contracting that strong odor which lead plaster obtains after some time.

From that time I have gradually diminished the amount of water directed by the Codex, and after several trials have adopted the following formula :—

Lard, olive oil, - - - - - -	5000
Litharge, - - - - - - -	5000
Water, - - - - - - -	1800

This quantity of water added at the commencement, is always sufficient. The operation to be performed on a fire of such activity as to keep up ebullition, without interruption, for two or two and a half hours. The appearances are

the same as when twice or thrice the amount of water is used, except that the puffing up is less considerable.

In every case, by experience it will readily be learned when it would be prudent to add a little water to complete the preparation. The water is not totally evaporated until the plaster sinks down, and slightly fuliginous vapors arise.

Before speaking of the advantages which this method presents, it will not be useless to add that there is one circumstance on which success essentially depends. The olive oil should be pure: adulterated, as it frequently is in commerce, but an imperfect product will result, and which cannot be used, as some of my friends have found to their cost.

I may likewise add that the quantity of water indicated would probably suffice for a larger amount of plaster; but in preparing less there would be a risk of burning if the water were diminished in proportion to the other ingredients. It is evident that for 5, 10, or 15 kilogrammes of matter, the evaporation of the water would present but slight differences, as the time of the operation would remain nearly the same.

It is recommended to pour upon the plaster, when made and hot, some cold water, for the purpose of cooling, and to facilitate the kneading: this water dissolves the glycerine, or sweet principle, produced by the reaction between the oil and oxide of lead. Formerly this principle was not separated, as not injurious; on the contrary, I think that it contributes to give suppleness, the adhesive state of which Lemery speaks. This washing would then be injurious. If then no water be added, if little or none remain when the process is complete, kneading becomes useless; and in all cases is not the kneading improper? Does it serve any other purpose than to intermix minutely throughout the plaster, air and water? The presence of these two agents would tend to determine part of the rancidity, as is seen in fatty bodies, of which the surface remains exposed to the air.

There is, then, a real advantage in not washing the plaster, and in consequence in not kneading it.

It should be, while hot, run into wooden moulds to cool slowly, by which any uncombined litharge may precipitate, and the excess of water rise to the surface.

Thus prepared, the plaster may be spread without any other addition except of olive oil, when the weather changes from hot to cold, in which case the addition should be made before and not after melting the plaster. Heated together, the union is more intimate. It is an incontestable fact that fatty matter in the plaster, but not combined, favors rancidity, and it may be supposed that it is this rancidity that gives irritating properties to the plaster when spread.

Ceruse, which is sometimes added, if not hurtful, is at least useless : it is not of consequence that the whiteness of the plaster be more or less striking, provided it answers the purposed for which it is used.

The practical observations which precede, have the sanction of experience, as more than one pharmaceutist at Lyons has adopted and recognized the utility of the process.

I believe we may draw the following conclusions :—

1. Simple plaster may be prepared with less water than is usually employed.

2. This plaster is the more supple, adhesive, and shining, as there remains less water interposed.

3. Glycerine aids to maintain the plastic state, which renders useless the addition of oil, to prevent cracking.

4. Washing and kneading are injurious : the one dissolving and separating the glycerine, the other interposing air and water, which disposes the plaster to become rancid.

5. Finally, if cold weather should necessitate the addition of oil, this should be added before liquefaction.

Journ. de Chim. Med.

ART. LXVII.—TREATMENT OF HOOPING COUGH BY COCHINEAL.

Dr. Cajitan Wacht of Vienna, has treatednine children affected with hooping cough, by cochineal, which has been already used for that purpose by English physicians. The medicine has been administered in every stage of the disorder, and its efficacy has been so very instantaneous, so constant, that notwithstanding, the small number of cases Mr. Wacht had, he believes himself authorised to announce cochineal a specific in hooping cough. The following is the mixture he used :

Cochineal	10 decigrammes.
Sugar	32 grammes.
Warm Water	192 grammes.

Dissolve. Dose, 3 teaspoonful during the 24 hours.

It should not be used after it has been made 36 hours, decomposition having then commenced.

Journ. de Med.

Note by Translator.—The mixture commonly used in this country, is formed of Cochineal ℈j., Salt of tartar ℈ij., Water 4 oz. Dose a teaspoonful. From Mr. Wacht's statement above given, it would appear, that its agency in the cure of hooping cough, is due to the cochineal alone.

A. D.

ART. LXVIII.—UPON THE SARSAPARILLA OF BRAZIL.

By A. Richard.

Brazil, from the extent and variety of provinces pertaining to it, is undoubtedly one of those countries that furnish the greatest number of useful medicines. Already, many learned naturalists, at the head of whom, are to be placed, MM. Auguste St. Hilaire, Martius, Riedel, &c. have made us acquainted with a great number of the treasures which therapeutics can draw from this beautiful country. May we not hope, that young Brazilians, animated with the desire to become useful to their fellow citizens, will hasten to enter the path that has been opened to them by the European naturalists who have visited the different parts of the Brazilian empire, and will collect gradually all the materials necessary for the preparation of a medical, and economical natural history of that country.

Among the medicines that commerce has brought from Brazil, is one with respect to which we have (at least in France) but an incomplete account; this is the kind of sarsaparilla called *Portuguese* or *Brazilian*. This kind is now so much diffused in commerce, that it is scarcely of higher price than the Mexican. The fibres are very long, cylindrical, rugose longitudinally, presenting lateral fibrillæ. Their color is brown, or sometimes very deep gray, bordering upon black. This difference evidently depends upon the nature of the soil in which the plant has grown. The color internally, is nearly white. Its taste is insipid, a little mucilaginous, and slightly bitter. This last flavor only developes itself when the root has been kept some time in the mouth.

This root generally comes from the provinces of Para and Maranhas. It is in cylindrical bundles of some length, and closely wrapped with a band, which goes from one end to

the other. The fibres are separated from the heads. Those that exist sometimes are pretty large and knotted; the base of the stems that adhere to them are connected with one or two, from which the fibres go off equally. The stem itself, from the size of the little finger to that of the thumb, presents a great number of short thorns, thick at base, compressed laterally, and arranged in longitudinal and parallel lines.

A similar arrangement is observable in the heads of the sarsaparilla of Mexico.

From the researches of MM. Martius and Grisebach, this root is that of the *Smilax papyracea* of Poiret, (Encyc. Meth. iv., p. 467.) This species was at first confounded either with the *Smilax officinalis* of Kunth, or the *Smilax syphilitica* of Humboldt, which are different, and which grow in Brazil. Dr. Grisebach (in the great Brazilian Flora, published by MM. Martius and Endlicker, article *Smilaceæ*,) has given a complete description and an excellent figure of this species. It is an undershrub, the stem of which is compressed and angulated inferiorly, and armed with spines upon the angles. The leaves are elliptic, acuminate, marked with three longitudinal nerves. This species grows principally in the neighborhood of the river Amazon and upon the banks of its tributaries. It is known in Brazil by the names *salsa*, salsaparilla, sarza'-zarza, &c.

Beside this species, which really furnishes the sarsaparilla in European commerce under the name of Brazilian or Portuguese, Brazil possesses the *Smilax officinalis*, which grows in the province of Mines; the *S. syphilitica*, growing in the northern regions, and three other species—the *S. japicanga*, *S. brasiliensis*, and *S. syringoides*, the roots of which are used by the inhabitants of the provinces where they grow for the same purpose as those of the *S. papyracea*.

Finally, the same family of *Smilaceæ* or *Asparagineæ*,

furnishes, also, in Brazil, another plant (*Herreria salsaparilha*) a shrub that abounds in the provinces of Rio de Janeiro, of Bahia and of Mines, the root of which has the name of wild sarsaparilla (*Salso do Mato.*) This kind is not met with in commerce. *Jour. de Chimi. Med.*

ART LXIX.—EXTRACTION OF SANTONINE.

Mr. Calloud having put into practice the different processes indicated up to the present time, for obtaining *Santonine*, has been induced to adopt the following, which in part is due to him.

30 kilogr. of semen-contra (Sem. Santonici,) are to be placed in a large kettle, with a sufficient quantity of water, and heated; after ebullition has taken place, add enough of slacked lime to saturate the santonine, and at the same time, fix the principal part of the coloring water. Submit the product to the action of the press, and put back the residuum into the kettle, and exhaust with a new part of hot water; express anew, unite the decoctions, allow it to deposit, decant the liquid, which you transfer to a large dish, and evaporate to a certain degree of concentration, clarify and pass through a flannel. This done, replace the liquid upon the fire, and evaporate again to a convenient degree, then pour it into a large earthen pan, and add a slight excess of hydrochloric acid. After twenty-four hours of repose, the *Santonine* will be found more or less pure. By means of weak alcohol, wash it, to separate the larger part of the fatty resinoid matter; express the residue, and treat it with boiling alcohol and charcoal, that it may crystallize.

The acid mother liquor, still holding in suspension a cer-

tain quantity of *Santonine*, should be saturated, with milk of lime, and evaporated again.

Santonine is a principle *sui generis*, approaching somewhat in character the concrete volatile oils, or *stearoptenes*. It is presented in the form of brilliant crystals, which are elongated, quadrilateral tables; inodorous, and almost insipid, arising from its little solubility, requiring five thousand times its weight of cold water to dissolve it. Its solution in alcohol has a very decided bitterness.

According to Mr. Calloud, *Santonine* has a special mortal action upon the *lumbricoides*, he having administered it to hundreds of children with such a success as to exceed his expectations. The insipidity of this substance, causes it to be preferred to the oil of the semen-contra, which is excessively acrid. Mr. C. associates it with sugar, and gives it in the form of lozenges.

The dose is 30 to 50 centigrammes a day. Each *tablette* should contain 2½ centigrammes of active matter. A. D.

Bulletin de Therapeutique.

ART. LXX.—ON THE ACTION OF NITRIC ACID ON ALCOHOL, AND ON NITRIC ETHER.

By M. Millon.

All attempts, to the present time, to effect a combination of nitric acid with ether have been unsuccessful; exhibiting a very peculiar hiatus in the midst of the compound ethers; and the absence of this compound was rendered still more remarkable by the discovery of a nitrate of methylene.

The effect produced on the mode of oxidation of metals, by the admixture of nitrous acid with the nitric, caused a sus-

picion, that the production of nitrous acid, would likewise modify the oxidation of organic substances, by means of nitric acid. In fact, I have succeeded in changing completely the action of nitric acid on alcohol, by preventing the production of nitrous acid. To effect this it is only necessary to add a little nitrate of urea, to the mixture of acid and alcohol; there will then be obtained, by a naked fire, a calm and regular distillation, instead of the tumultuous action which characterizes the ordinary action of nitric acid on alcohol; and the numerous products, among which nitrous ether is preeminent, are replaced by a single new product, nitric ether, which passes into the receiver, accompanied by alcohol and water.

The nitric acid should be carefully purified; the presence of hydrochloric acid renders the nitrate of urea totally ineffectual, and the common action of nitric acid and alcohol will result.

The proportions of acid and alcohol are not indifferent; the operation always succeeds very well, by taking one measure of concentrated nitric acid, containing 4½ equivalents of water, density 1.401, and 2 measures of alcohol of 35°, making nearly an equal weight of acid and alcohol.

If equal measures of acid and alcohol be used, the nitate of urea will again fail.

It is, besides, proper not to act on too large a quantity of material, and the mixture should not exceed 150 or 200 grammes; one or two grammes of nitrate of urea will then be sufficient to regulate the process.

The heating should be moderate; the first product of the distillation is weak alcohol; but the nitric ether soon becomes perceptible by its peculiar odor, and on adding water to the distilled product, separates as a liquid heavier than water. After some time, the nitric ether is so abundant, as to form a dense layer in the receiver.

If the process be pushed until all the mixture of the alcohol and acid in the retort has been drawn off, then the tu-

multuous reactions of the alcohol take place towards the end of the operation. But by arresting the process, when about the eighth part of the mixture remains, the nitrate of urea remains undecomposed, and is soon deposited by the acid liquor ; the residue may serve for a second, third, or even a fourth operation.

If the nitrate of urea which is employed be colored, it is recovered of a perfect whiteness. We may thus combine the purification of the nitrate of urea, with the preparation of nitric ether ; for this purpose, crude nitrate of urea, such as is obtained by precipitation from very concentrated urine by nitric acid may be used ; the precipitate is expressed, and introduced into a mixture of nitric acid and alcohol. Distillation is to be carried on until the nitrate begins to form crystalline plates, on the surface of the liquid. Nevertheless, the decoloration is not satisfactory, if the weight of the nitrate of urea exceeds 50 or 60 grammes.

As to the purification of the ether, it is analagous to that of formic, and a number of compound ethers. The ether is washed with an alkaline solution, then with distilled water, after which it is left in contact with fragments of chloride of calcium for a day, and distilled.

This ether has been analysed, having been previously dissolved in alcohol, and precipitated by water.

The analysis gave the following numbers :

	I.	II.	III.	*Calculated.*
Carbon	26.59	26.50	"	26.32
Hydrogen	5.89	5.72	5.83	5.48
Nitrogen	15.07	15.26	"	15.54
Oxygen	"	"	"	52.65

Combustion with oxide of copper is readily effected. The determination of nitrogen requires several precautions, in which the paper of MM. Dumas and Peligot on wood spirits is an excellent guide.

The formula of nitric ether may be expressed thus :

$$NO_5,C_4H_5O$$

A concentrated aqueous solution of caustic potassa is without action on nitric ether; but an alcoholic solution decomposes it, even in the cold, and abundant crystals of nitrate of potassa are formed, without the least mixture of nitrite.

Its odor is sweet and mild, but not resembling nitrous ether.

Its taste, very sweet, leaving behind a slight bitterness.

Its density, greater than water, is 1.112 at 17° C. (62° F.); it boils at 85° C. (185° F.)

It burns with a very white, and bright flame.

At a temperature little above its boiling point it is decomposed.

Concentrated nitric acid destroys nitric ether; and some attempts made to obtain nitrovinic acid, or the nitrovinates, were not satisfactory.

Hydrochloric acid likewise destroys nitric ether, aqua regia being formed.

Sulphuric acid containing an equivalent of water, dissolves one-fourth of its weight of nitric ether, without, if the ether be gradually added, any phenomena appearing at first; but after a short time the mixture gives off vapours of nitric acid, and still later, heats greatly with the production of nitric oxide; the sulphuric acid blackens, and all the ether is destroyed.

Iodine dissolves in the ether, and communicates a beautiful violet color.

Chlorine attacks it promptly; but I could not separate any definite product as the result of this action; whether that the chlorine produced a complete separation of the elements, or the hydrochloric acid formed likewise, entered into the action, and complicated the phenomena.

Nitric ether is wholly insoluble in water; one thousand parts does not essentially diminish one part of the ether; on the contrary, it dissolves in every proportion in alcohol, from which it is readily precipitated by a small quantity of water.

The intervention of nitrate of urea, in the production of nitric ether, is explained by the action of the urea on nitrous acid ; these two bodies mutually decompose each other, giving rise to equal volumes of nitrogen and carbonic acid. So that the urea prevents the formation of nitrous acid.

The primitive action of nitric acid on alcohol, is that of all volatile acids, viz., the production of a compound ether : but nitric ether is decomposed, or rather its formation within moderate limits, is accompanied by a slight production of nitrous acid, immediately effecting a new action ; and as the temperature rises, complicated reactions take place between the alcohol and nitric acid.

Thus, it is only at the moment when the nitrous acid mixes with the nitric, that there is developed the changes which we are accustomed to attribute to nitric acid itself. We may even say, that this latter is not the sole or even the direct cause of the tumultuous action, but it is only the source of the nitrous acid. In a word, it is with alcohol as with the metals, in regard to nitric acid and aqua regia. We there find ourselves observing mixed reactions, of which we should carefully distinguish the terms and appearances. Although this analysis of phenomena may appear minute, it is not the less indispensable for obtaining a clear idea of what appertains to each reagent, that is to say, to each particular chemical force.

Ann. de Chem. et de Phys.

ART. LXXI.—UPON THE ACTIVE PRINCIPLE OF THE GASTRIC JUICE.

By M. Payen.

Mr. Blondlot has been willing to offer me the occasion of repeating his fine experiments, and place at my disposition the gastric juice obtained by his ingenious mode,* for the chemical experiments I would undertake.

I hastened to accept this twofold proposition, and the reactions described in Mr. Blondlot's treatise were reproduced with signal success. Operating in a comparative manner, I proved without difficulty the following phenomena, under the influence of the gastric juice and a sustained temperature, during eight hours between 36° and 39° Cent.

1st. Cooked meats, *boiled beef* and *ham*, were disaggregated to such a degree as to be reduced, by slight agitation, to a pulpy substance containing small fibrils.

2d. *Ichthyocolla* was disaggregated and partially dissolved, the solution having lost its gelatinous form.

3d. Slices of dry cowhide cut perpendicularly with the surface of the epidermis, suffered disaggregation, a large portion of the cellular tissue dissolving, showing the hair disengaged and crossing the epidermis.

* To obtain the gastric juice in abundance and in a state of purity, Mr. B. established a permanent communication by means of an artificial opening in the stomach of a dog, which enabled him to penetrate and withdraw at pleasure either the gastric juice or alimentary matters, in the different stages of digestion. His efforts were crowned with success, and the animal upon which he made his first trials, more than two years ago, still lives. Though of inferior size, he could furnish on a single occasion more than 100 grammes of gastric juice.—*Recherches sur les phénoménes de la digestion, et spécialement sur la composition de suc gastrique.*

4th. White and diaphonous *gelatine* was dissolved, no longer recovering its gelatinous form upon cooling.

The same substance in equal volumes, placed in water, acidulated with hydrochloric acid in a manner to present evidently the same acidity, did not experience, after eight hours of contact at a temperature of 36° to 39°, the least appreciable change; the muscular tissues had preserved their form and a great resistance, and the gelatine took upon cooling the form of a firm and transparent jelly.

To these corroboratory experiments I was happy to observe, in addition, the direct action of the juice of the stomach upon a portion of compact bone. Two cylinders were prepared of equal dimensions (diameter, 7 millimetres, height, 32 mm. 1.) One of these two wrapped up in a gauze, stitched and retained by a thread, was introduced into the stomach of the dog, which remained in my laboratory for 50 hours: at the end of this time the plug was withdrawn, and the thread attached to it brought out with it, the cylinder still enveloped but so lessened in all its dimensions that its least diameter was then only 4 mm. 6, and its height 28 millimetres; the total weight had been reduced from 2 gr. 780 to 1 gr. 005. It will be easy to judge of these effects by comparing the intact cylinder with the cylinder in part digested, which I have presented to the Academy. This latter, it should be remarked, had preserved its first solidity: the angles of the base were rounded off, the superfice was striated with slightly projecting lines corresponding, doubtlessly, to the osseous parts where the texture is closer: hence it is evident that the action of the gastric juice disaggregates, by peripheric layers, the whole of the osseous substance, whilst, as every one knows, bones dipped in weak hydrocloric acid allow their calcareous salts to be dissolved, and exhibit, after the reaction, their organic tissue *hydrated*, rendered flexible and supple.

This last and curious verification of the results announced

by Mr. Blondlot, encouraging me to profit by his obliging offer, I took up again the experiments made some years ago under less favorable circumstances, and which it may be useful to recapitulate.

Mr. Valentin had offered to my learned friend Mr. Magendie to repeat, in his presence, the experiments upon artificial digestion, by means of what was then called by Mr. Schwann, and since him, by Mr. Muller, *pepsine*.

This substance, the discovery of which had fixed the attention of the *savants* of Germany, was supposed to be contained in a weak solution of hydrochloric acid which had been placed in the stomach of a calf during several hours. The experiments took place in the College of France; a stove of even temperature was employed, and several substances were tried, particularly muscular tissue and coagulated albumen, in the digestive liquid comparatively with acidulated water, for 12 hours.

The examination of the results was made by Messrs. Magendie, Valentin, Poisseuille, several others, and myself. All the results were found negative; the meat remained hard and the albumen preserved the angular forms of all its fragments. Mr. Valentin attributed the want of success to the weakness of the acid used, which threw off less vapours than the one employed by Mr. Schwann.

Upon these indications I made some new experiments, but found it impossible to obtain positive effects, or extract by Mr. Schwann's process, or others which I essayed, any principle to which could be assigned the special property in question. Having now the disposition of a normal gastric juice endowed with great energy, I hope to be more successful; and in fact, from the first attempts in the direction which I had formerly followed in vain, I have succeeded in isolating a white or delicately amber colored substance, diaphanous, very soluble in water, easily dried, and so very active that it will disaggregate more than three hundred

times its weight of the muscular tissue of boiled beef, and much more rapidly than could be effected by the gastric juice itself.

The term *pepsine* does not answer to apply to this active substance, since it is not only when the animal is hungry that it is secreted, but at the moment the aliment stimulates the stomach: for this reason I think proper to give to it the name of *gasterase*.

If I do not now make known the means of extraction, it is in the hope to give them less imperfect, and to join to them the results of an analysis which may better determine the nature and limits of action of this active principle. A. D.

Journal de Pharmacie.

ART. LXXII.—ON THE PREPARATION OF PURE IODIDE OF POTASSIUM.

By Messrs. Thos. and H. Smith, Edinburgh.

Of the value of the various processes which have been recommended for the preparation of the iodide of potassium, in reference to their facility of preparation, economy, and suitableness for the production of a pure salt, we do not feel ourselves qualified to give an authoritative judgment; we are, however, inclined to give the preference to that adopted by the Colleges of London and Edinburgh, which is grounded on the double decomposition of the iodide of iron by a solution of the carbonate of potash; but by proceeding in the way recommended by these colleges, a pure salt cannot be obtained, except by a tedious process of crystallization and recrystallization, or by dissolving in alcohol, and thus separating it from those impurities insoluble in that menstruum,

but this is an element in the process which, as it adds very materially to the cost, and is to a great extent unnecessary, will not be generally adopted.

For the preparation of the compound under consideration, we use a glass flask, capable of containing six imperial pints and having filled it to within a sixth of its capacity with distilled water, previously boiled and cooled, pour out into a bason so much as to leave the flask half full; our reason for this is, that we may have a measure of the quantity of water for dissolving the alkaline carbonate, so that we may be able to pour the solution into the flask at once, and without hesitation.

The carbonate of potash we use is prepared by heating to redness crystallized bicarbonate of potash, so as to expel the excess of carbonic acid; but as it is most important that we should use a pure salt, we test its purity, before considering it fit for our purpose ; having, therefore, dissolved thirty or forty grains in distilled water in a test glass, and acidulated with an excess of nitric acid, we add first nitrate of silver, and then nitrate of baryta, or chloride of barium. If these merely produce an almost imperceptible haze, we do not consider the salt unfit for the end in view; but, if the reaction be more decided, we reject the specimen as altogether unfit for our purpose; if the solution of a fresh portion stand these tests, after neutralizing with ammonia the excess of nitric acid previously added, it will be still more suited to the proposed end.

The Edinburgh College orders a pure carbonate prepared from cream of tartar by ignition; and Dr. Christison, in his Dispensatory, supports it in this preference, for the alleged reason that the carbonate prepared in this way is cheaper than that prepared from the bicarbonate; but this is not the case, as may be easily proved by calculation. Thus, the equivalent of bicarbonate of potash is 100.39; that of the anhydrous carbonate is 69.27; consequently 16 ounces of the first by ignition produce 11.04 ounces of the second. Again,

as the equivalent of the acid tartrate of potash is 189.11, one pound of this on being ignited cannot produce more than 5.86 ounces. Now, since 11.04 ounces of carbonate obtained from sixteen ounces of the bicarbonate cost 1*s.*, which is about the price per pound of the latter, a pound will cost 1*s.* 5½*d.*; whereas one pound of cream of tartar at 10*d.* per pound, producing only 5.86 ounces of pure carbonate, each pound of it obtained in this way must cost 2*s.* 3*d.*, being 9½*d.* per pound dearer than that obtained from the bicarbonate; besides, the time and trouble required in preparing a pure salt from cream of tartar is very much greater than when the bicarbonate is used. For these reasons, when we can obtain a pure bicarbonate, we use it in preference.

Having proved its purity, we put 7½ ounces troy, reduced to coarse powder, into a crucible, and heat it for about half an hour at a low red heat, and, after it has cooled sufficiently, weigh out four ounces, and dissolve in the water poured from the flask into the bason, and the rest in two or three ounces of hot water in a test glass or phial.

Previous to this we have prepared the solution of iodide of iron; for this purpose we add nine ounces troy of iodine to the water in the flask, and then three ounces troy of pure iron filings, the iron being in the same proportion to the iodine as in the formula of the London college; frequently a much larger proportion than this is recommended: so much even as double the weight of iodine: but the above proportion is fully sufficient, and no useful end can be obtained by using more.

The action resulting from the contact of the iron and iodine having ceased after brisk agitation, we take advantage of the heat produced, and immediately raise it to the boiling point over a rose gas-burner, or in any other convenient way: we stop the ebullition when the froth becomes white, and allow the liquid to cool down to about 100° Fahr., when we immediately pour in the solution of carbonate of potash con-

tained in the bason, and mix by agitation, taking care to remove the hand occasionally from the mouth of the flask, to allow of the escape of carbonic acid, which is slowly given off; in doing so, the operator must be careful to give vent to the pent-up gas on the side of the flask farthest from his person, otherwise he will run the risk of having his clothes disfigured with red stains from the ferruginous liquid.

If the mixture be made at a somewhat higher heat, the escape of gas is so rapid, that there is great danger of the liquid boiling over, and thus leading to considerable loss; on the other hand, if the solutions be mixed at a lower temperature, the precipitate is very slow of subsiding, and this interferes with and retards the process.

We now fill up the flask to the commencement of the neck with distilled water recently boiled, agitate, and set aside to allow the precipitate to settle; our reason for filling up the flask to its narrowest part is, that as small an extent of surface as possible may be presented to the decomposing action of the air.

We have now in the flask a solution of iodide of potassium, with an excess of iodide of iron, together with a bulky white precipitate of protocarbonate of iron.

To neutralize the excess of iodide of iron, either of two methods may be adopted: We may at once proceed to neutralize the excess by adding, gradually, the solution of the carbonate from the test glass, agitating after each addition, until the liquid restore the blue color to litmus reddened with a single drop of muriatic acid to about six ounces of water. This can be easily managed by dipping the point of a glass rod into the mixture in the flask, and then applying it to one of a number of small slips of the paper placed by the side of the operator. We give the preference to the other method.

After the precipitate has sufficiently settled to give a clear liquid, we pour in a little of the solution of the alkaline car-

bonate, and as there is an excess of the iodide of iron, a white precipitate is immediately produced. We now agitate the flask briskly, to mix the solutions thoroughly, and likewise that the heavy sediment may envelope the very light precipitate last produced, and carry it down quickly, so as to leave the liquid clear, otherwise the liquid would remain thick and cloudy for a very long time.

By proceeding as directed, the liquid in a few minutes becomes quite transparent; we then add more alkaline solution, and proceed as before. We continue adding the solution, but more cautiously towards the end, till no reaction is produced on a fresh addition.

After complete subsidence of the sediment, we pour off the liquid into an evaporating bason, and press the precipitate strongly in a cloth; we then break up the mass in about six ounces of distilled water, press again, and add the liquids to that already in the basin, and evaporate till near the point of crystallization.

We may here remark, that we prefer pressing through a cloth, to the tedious process usually recommended of washing the precipitate on a filter, with an abundance of water, till every trace of iodide be removed from it, and thus increasing unnecessarily, and to a large amount, the quantity of liquid to be evaporated; and we feel persuaded that we will be supported in our view of this matter by every practical man, and for the following reason:

After pressing strongly the precipitate, there is not at the most more than an ounce of liquid left; and as the whole amount of the liquid was six pints, or 120 oz., and contained in solution 11.8 oz., or 5664 grains, of iodide, there could only be the 1-120th of that quantity in what was left, that is 47 grains; but as the precipitate was diffused through six oz. of water, the whole seven oz. would contain no more than 47 grains; and, on again pressing, only the seventh part would be left behind, which is somewhat less than seven grains.

A moment's consideration will show that the value of this could never compensate for the time spent and fuel consumed in filtering and evaporating three pints of liquid, which is the amount ordered by the London college for the quantities used in our process.

To return from this digression: having concentrated the solution to the extent mentioned, it will be found almost invariably that the liquid shows a strong alkaline reaction; for however carefully the alkaline solution may be added, it is almost impossible to avoid an excess; this excess must therefore be remedied, and the method we adopt for this end is the following:—

We prepare, in a Florence flask, a solution of iodide of iron, from ʒiij. iodine, ʒj. iron filings, and ʒvj. of water; with this proportion of cold water, the action goes on with perfect safety, but, with very little less, the heat developed is so great that the liquid almost instantaneously enters into uncontrollable ebullition, and the whole contents of the flask are expelled with a sort of explosion. In using the proportions we have adopted, the heat produced is nearly sufficient to bring the solution to the boiling point, so that a few minutes' application of the gas-flame renders the liquid sufficiently clear.

We do not think it useless to remark here, that the cautions commonly given, not to apply more than a very gentle heat, do not appear to us to be well grounded, and proceed from a needless fear of the loss of iodine; the attraction of iron and iodine in the presence of water is so energetic that they combine almost instantaneously; and, after the action, the quantity of iodine, in a free state in the liquid, must be very small; and we should conceive that there is less likelihood of a loss of iodine by applying the heat rapidly than otherwise, inasmuch as the currents in the liquid are rendered more rapid, and thus every point is brought successively in contact with the iron diffused in this way through the fluid; and, in our opinion, the clearing of the liquid re-

sults more from the action of the iron than the expulsion of free iodine by the heat. At any rate, however rapidly heat may be applied, there is very little escape of iodine, and we never found that we obtained a less quantity of iodide of potassium when a quick heat was used than when it was more gentle.

Having now prepared a strong solution of iodide of iron, which is done in a few minutes, we allow it to settle a little; then pour it into a phial from the sediment without filtration; about an ounce of water may then be poured into the flask, and the sediment washed with it, and, after subsidence, poured into the concentrated solution of iodide of potassium. We now continue adding gradually more from the phial, till the liquid ceases to restore the blue color to reddened litmus.

After heating to aggregate the precipitate, we filter the liquid, washing the precipitate properly; for this purpose we use a double filter, the liquid being so dense that a single one would inevitably give way under its weight: unite the liquids and evaporate to dryness, and fuse the dry salt in an iron pot provided with a cover; the fusion may be easily accomplished with a brisk open fire, and care must be taken not to continue the heat a single instant after complete fusion has been effected.

Without the application of a heat sufficient to fuse the iodide, we cannot, without great difficulty, obtain it free of color, probably arising from excess of iodine, and possibly organic matter; but in this way they are both completely removed.

By dissolving out the iodide and filtration we get a perfectly colorless solution, and by successive concentration and cooling, we obtained a perfectly pure and colorless iodide nearly to the very last.

Whenever the crystals begin to show the presence of impurities, which can be easily known by the form and appearance they present, or their partial solubility in alcohol,

we evaporate to dryness, and purify the residuum with alcohol, or reserve it for this purpose till a sufficient quantity is collected.

We obtain the iodide of potassium in beautifully regular crystals, by covering the bason, after due concentration, with a plate, which prevents rapid evaporation from the surface, and the consequent formation of a crust, placing it on a bad conductor, such as a piece of charred wood, and surrounding the whole with several folds of a dry cloth, formed of some good non-conducting substance; in this way the liquid cools very slowly, and allows time for the solid particles to arrange themselves in a regular manner.

A saturated alcoholic solution of the iodide, which had been used for its purification, after standing aside for about twelve months in a bottle loosely corked, had deposited, at the bottom of the bottle, a mass of loose acicular silky crystals.

It is almost invariably asserted in chemical works, that the iodide is a deliquescent salt; this is not the case when it is perfectly pure and free from excess of the very deliquescent carbonate of potash. We have kept a pure specimen crystallized from alcohol in an open dish, exposed to all conditions of the atmosphere for weeks, without appearing damper than when just taken from the stove.

Pharmaceutical Journal.

ART. LXXIII.—AMBERGRIS.

By Mr. Payne.

It is well known that the nature and origin of ambergris were, for a very long period, quite unknown. "Authors differ," says Dr. Kæmpfer, "widely in their opinion both as to its origin and production; nor do they even agree as to what kind of substance it properly is. Some take it to be a bituminous substance, others a sort of earth or clay; some think it is a sea-sponge, others the dung of birds. Dr. Denys, in 1672, asserted, that 'ambergris is a mixture of wax and honey, gathered upon the sea-coasts by bees, which, by being digested by the heat of the sun, falls into the sea, where by the motion of the waves and admixture with saline particles, it becomes changed into this precious article;' but the most generally received opinion is, that it is a kind of bitumen generated in the bowels of the earth, or a subterraneous fat grown to the consistence of a bitumen, which by subterraneous canals is carried into the sea, where, by the heat of the sun and admixture of saline particles, it becomes ambergris."

After refuting the assertion of Dr. Denys, by several arguments not necessary to mention, Dr. K. goes on to describe its varied appearance as at that time usually met with. He tells us, that he himself saw a fine greyish specimen, weighing 180 lbs. Dutch, which had been divided into four parts; another piece found in 1693 was sold by the king of the country for 11,000 rix-dollars, about £2000 sterling, to the Dutch East India Company; it was sent to Amsterdam, where it was then kept, and it weighed 185 lbs.; it was of a grey color, in shape not unlike a tortoise with the head and tail cut off, and was bought on condition that, if found

adulterated, it was to be returned (certainly a very good precaution, but not so easily to be accomplished.)

Dr. K. next speaks of the adulterations to which it is liable, and gives some modes for detecting them, all of which Mr. Payne fully detailed.

Mr. Payne then proceeded to observe, that it is usual to prefer ambergris which, on fracture, presents a greyish and somewhat speckled appearance; unctuous when pressed between the fingers; smell somewhat resembling old cow-dung; tolerably soluble in rectified spirit, to which it imparts its odour, and in proportion to which solubility its quality or purity may be determined; depositing from the solution, when dried off, a whitish and fatty residuum.

Ambergris is now well known to be obtained from the intestinal canal of the cachalot, or sperm whale; so that the name of *whale's dung*, which Kæmpfer tells us the Japanese have given to it, is by no means an inappropriate one. It is usual to meet with extrinsic impurities in it, which have been mistaken for shells, but which are in fact the beaks of the *Sepia moschata*, on which the sperm whale feeds. This is a strong confirmation of the common opinion of the intestinal origin of ambergris.

According to some writers, it is regarded as hardened fæces merely; while others consider it to be a product of disease. Mr. Beale, in his *Natural History of the Sperm Whale*, (1839,) observes, that on one occasion, while in the North Pacific, he had the curiosity to collect some of the semi-fluid fæces which floated from the carcase of a whale, while the men were cutting it up; and which, on being dried in the sun, bore all the properties of ambergris. On the other hand, Mr. F. D. Bennett, in his *Narrative of a Whaling Voyage round the Globe*, (1840,) declares, that "ambergris is a morbid concretion in the intestines of the cachalot, deriving its origin either from the stomach or biliary ducts, and allied in its nature to gall-stones, or to the bezoars of herbivorous animals; while the masses found

floating on the sea are those that have been voided by the whales, or liberated from the dead animal by the process of putrefaction.

"It is not common," he adds, "for the whaler to find ambergris in the cachalots he destroys; nor does he, indeed, make a very rigid scrutiny of the intestines in search of it, unless a suspicion of its presence be excited by some marked peculiarity in the whale, as a torpid and sickly appearance, and the animal failing to void liquid excrement, as is usual with healthy whales, when alarmed by the sudden approach to the boats, or struck by the harpoon. Some years ago, the whale-ship 'Mary,' of London, discovered a dead cachalot floating on the ocean, and as there were no injuries on its body to account for death, that event was attributed to disease; consequently the whale was searched for ambergris, and the captors were gratified by finding a very large quantity of that valuable drug impacted in its bowels."

The Greek merchants are purchasers of ambergris, in some quantity, it is believed for use in their religious ceremonies; and Mr. Payne stated that he had found their judgment useful in deciding on its quality, and had occasionally met with some small pieces in their possession of considerable fragrance, and of apparently a different species to that usually met with in our markets.

Although ambergris is seldom used in this country, excepting as a perfume, it is esteemed as a valuable medicine in some eastern countries.

Mr. Payne further observed, that a very spurious article is sometimes met with—which may be readily detected on the slightest examination of its external character by any one who has seen specimens of the genuine kind.

Ibid.

ART. LXXIV.—ON HEMIDESMUS INDICUS.

By Mr. Jacob Bell.

(Syn. *Periploca indica*, Wild. *Asclepias pseudosarsa*, Roxb.)

The root of *Hemidesmus indicus* has for some years been sold in this country under the name of *Smilax aspera*. It is imported in considerable quantities from India, where it is called *country sarsaparilla*, *nannari*, or *nunnarivayr*. Dr. Ashburner, who introduced it to the notice of the profession in this country, gave it the name of *Smilax aspera*, on the authority of Ainslie; but it is evident that a misunderstanding existed respecting the identity of the plant, as the roots are essentially different, which will appear from an examination of the specimens on the table. The *Smilax aspera* is a tough, cylindrical root, having very little taste or smell, and covered with a thin, smooth, brown bark, which also is insipid. The root of *Hemidesmus indicus* is also cylindrical, covered with a brown bark, and is similar in dimensions; but it is more tortuous, rugose, and is furrowed longitudinally. The bark is very thick, brittle, and aromatic, and constitutes above half the substance of the root. By bruising in a mortar, the bark crumbles off, and may easily be separated by sifting, as the wood, although not nearly so tough as that of *Smilax aspera*, is much less brittle than the bark. The aroma, which is very strong, and similar to that of new hay, resides chiefly in the bark; but even the wood possesses enough of this peculiar character to distinguish it from that of *Smilax aspera*.

Mr. Garden, who examined the root of *Hemidesmus indicus* in the year 1837,* discovered in it a peculiar volatile substance, which he obtained in a crystalline form, and

* *London Medical Gazette*, vol. xx., p. 800.

which he termed *smilasperic acid*, (in the belief, which at that time prevailed, that the root was that of *Smilax aspera*.) Dr. Ashburner published a paper on this root in the *London and Edinburgh Physical Journal*,* in which he speaks in high terms of its efficacy in many of those cases in which sarsaparilla is recommended.

It has generally been administered in the form of a syrup, but an infusion and a decoction have also been used, the proportions being the same as those adopted in the decoction of sarsaparilla, namely, two ounces of the root to a pint of water.† There is no recognized formula for the syrup, unless that of the Pharmacopœia for syrup of sarsaparilla be taken as the standard, which has been proposed in consequence of the supposed similarity of the remedies. It is particularly necessary, however, in making the syrup of *Hemidesmus indicus*, to avoid a high temperature, which would dissipate the volatile principle of the root, and on this account, the following method of manipulation has been adopted with a satisfactory result:—

Take of the root of *Hemidesmus indicus*	1 lb.	avoirdupois
Refined sugar - - -	1 lb.	"
Distilled water, about - -	3 pints.	

Bruise the root sufficiently to separate the bark by sifting, and reject the wood. Add to the bark an equal bulk of washed sand, moisten with water (three or four ounces) so as to ensure its intimate mixture, and pack it well in a displacement apparatus. Add as much water as it will absorb, macerate for four hours, and displace the liquor by the addition of a further portion of water. Reserve the first six ounces. Add more water until it passes through tasteless. Then evaporate the latter portion to three ounces, in which, with the addition of the first six ounces, dissolve the sugar with as moderate a heat as possible. By this means, the

* Vol. lxv., p. 189.

† *Dr. Pereira's Elements of Materia Medica*, p. 1289.

first portion of the liquor, which contains the major part of the aroma, is not subjected to the process of evaporation, and the result is twenty ounces, by measure, of a syrup possessing all the aromatic properties of the plant.

Ibid.

ART. LXXV.—NEW TEST FOR STRYCHNINE.

By Eugene Marchand.

It often hapens that the chemist, when called upon to decide a medico-legal question, experiences some difficulty in proving the presence or nature of certain poisonous substances, either because he cannot procure a sufficiency of the poison, or else the re-agents serving to characterise them are too little sensitive, or do not offer that degree of precision as to allow you to pronounce with certainty in a capital case. Among the organic alkalies thus far known, we are all aware that strychnine is the most poisonous. Hence the discovery of a reaction which enables you to detect with certainty very minimum quantities, becomes a desideraatum.

I believe I have attained this object by the following process, which is so sensible as to give a yet very appreciable reaction, even when you operate upon an imponderable quantity of sulphate of strychnine.

When you triturate a very small portion of strychnine with a few drops of *concentrated sulphuric acid containing a hundredth of its weight of nitric acid*, the strychnine disappears without giving rise to any perceptible phenomenon: but if you add to the mixture merely an atom

of *peroxide of lead*, it immediately developes a magnificent blue color, which rapidly passes to violet, then gradually to red, and finishes lastly, after several hours, by turning to canary yellow. This reaction is characteristic of strychnine, as it has been impossible for me, up to the present time, to find a substance which acts in a like manner, under similar circumstances.

When you act upon infinitely small quantities of strychnine, it is preferable, in order to render the reaction more sensible, to triturate, in a dry state, a few particles of peroxide of lead with the organic alkali, then to let fall upon the mixture a single drop of the acid liquid. You will then distinctly perceive, in a manner not to leave any doubt upon the mind, the series of coloration I have above described, even when acting upon a portion of strychnine imponderable, but approximately estimated at one thousandth of a grain.

A. D.

Jour. de Pharm. et Chim.

ART. LXXVI.—OBSERVATIONS ON MUSK.

This substance is found secreted in a bag attached to the male musk deer, whose habitat is in the mountainous Kirgesian and Sangorian steppes of the Altai, on the river Irtysch. It exists also in Mongolia, Thibet, and Butan or Bontan, as far as Tonquin, and generally on the mountains of Eastern Asia, ranging between 30° and 60° of latitude.

In trade two distinct species of musk are known, comprising the Chinese Tonquin, Thibetian or Oriental musk, and that which includes the Siberian, Cabardinian, or Russian musk. These varieties, the one Russsian and the other Chinese, differ materially both in the external appearance of the bag and the color of the hair which covers it, as well as in their chemical and physical properties, and different effects on the human constitution.

These differences exist chiefly on account of the difference in climate which the animals inhabit, and the food which such variations in temperature occasion. Dr. Göbel is of opinion that these different properties of Chinese musk, as compared with the Russian, should be attributed to the difference of treatment which they undergo in China, and he considers that the Chinese musk is the natural product after it has been subjected to the ingenious adulterations of the Chinese. The following are the reasons for this supposition:—

Irbit, a small town of Asiatic Russia, known chiefly for the considerable barter-trade which is there carried on in the month of February, between Russian, Bucharian, and Chiwinzian tribes, with Persian, Armenian, and other Asiatic nations, is the main market for Siberian musk. It is less frequently taken to the market of Nischnei Novgo-

rod. The Asiatics bring to Irbit the musk bags enveloped in the original grayish-white skin, as cut from the musk deer, and sell them either to the Russians, who carry them to St. Petersburg and Moscow, or they dispose of them to Russian traders, who carry on a commerce with China by Kjachta.

The Russian merchants, who bring the musk from Irbit to St. Petersburg and Moscow, trade only between these towns and Irbit; but those who carry it to Kjachta trade between the said town of Kjachta and Irbit.

In case the price of musk is remunerating at St. Petersburg and Moscow, then the Russians who trade there purchase the musk bags, and pay good prices; on the other hand, when it is low in these places, the Asiatic finds his customer in the trader to Kjachta. Sometimes it is brought to St. Petersburg in large and sometimes in small parcels, occasionally packed in chests, whilst at others it is loosely carried in bags of leather or felt, and sold generally to druggists.

The price of Musk at St. Petersburg is regulated by the quantity of stock in hand. The Russian trader procures European wares with the product of his sale, which wares are destined to procure at Irbit a further supply of the drug. At St. Petersburg it is packed in tin caddies, hermetically soldered, and when exported these are packed in small wooden cases.

The Irbit musk is invariably enveloped in the grayish-white belly skin, and the bags are separated when it is sent to St. Petersburg, this being done only after it has been sold to the St. Petersburg trader; for a bag accompanied with the skin rarely arrives at St. Petersburg. If, however, the musk is sold to those traders who proceed with their wares for the Chinese market via Kjachta, this appendage is indispensable, because the Chinese, who exchange tea for it, would not purchase it except in its original state. From

Kjachta it is taken into the interior of China, and the process of adulteration it there undergoes is entirely unknown; but it is a fact, the authenticity of which is indisputable, that no Russian musk bag is ever re-imported from China, via Kjachta, the only trading mart between Russia and China; and further, that not a single bag of Chinese musk ever arrives in Russia via Kjachta.

In one year, 300, 400, and even upwards of 500 lbs. of Russian musk have been carried to China by Kjachta. In such years it may be presumed that but little musk arrived at St. Petersburg, where the rise and fall of the market price is governed by the quantity imported.

From St. Petersburg and Moscow there is annually exported a quantity of Russian musk, amounting to an average of 500 lbs. Perhaps one-half of this quantity is destined for the London market, where more especially the smallest bags are in demand, whilst the remainder is distributed amongst other European markets, more especially those of Holland and Germany, where the greater part is consumed.

The Russian musk, when exported from Russia, is always genuine and unadulterated; the bags never being opened, are consequently never sewn, or closed in any artificial manner. Sometimes it is obtained so fresh that moisture may be expressed therefrom by cutting through the fleshy side of the bag. The interior mass is frequently of a soft and pappy consistence; externally, however, the bags are perfectly dry.

Dyrssen, an eminent Russian merchant, proved to Dr. Göbel, by his books, that he annually exported, on an average, about 200 lbs. of Russian musk, and he stated that through other houses at least a similar aggregate quantity was sold; and lastly, from Moscow, in the winter, there was sent, via Brody, to Vienna, and through other channels, at least 100 lbs., giving an annual total of 500 lbs. of Russian musk, which was rather below than above the average quantity exported.

That which is termed Tonquin or Chinese musk comes into the market only through the London trade, and by no other channel; although much of this is consumed in Russia, no bag being ever received via Kjachta, but always imported directly from London. These Chinese musk bags are found, on examination, invariably to have been opened, and more or less carefully glued together; sometimes indeed the stitches are visible by which they are held together.

We have the assurance of Dyrssen, that during the many years he has been engaged in trade, although he has frequently received quantities of from 100 to 200 oz. at a time from London, yet in no case whatever has he met with a bag which had not been opened, and closed with more or less ingenuity. He believes also that he has recognised the Siberian bags, although somewhat modified. Whether the Chinese musk, in its peculiar package, is received in that state at the English factory at Canton, as is most probably the case, or whether it is there made up, we are not in a position to state. Dr. Fr. Göbel relates, that in the year 1825 he received through Jobst and Klein of Stuttgard, a Chinese musk bag, to which was adherent a portion of the skin attached to the belly; this Dr. Göbel opened in the presence of the eminent naturalist Oken, and it was represented by Ratzeberg and Brandt in their description of officinal animals, and of which Oken gave an account in his "Isis," and which appeared also in Kastner's "Archives." This bag, which the Dr. has still in his possession, was of the same form and in color and size of the hairs precisely similar to the Russian musk bag, with which he had an opportunity of comparing it whilst on a visit to Russia. The contents, however, of this musk bag differed materially, in their chemical and physical properties, from those of the pure Siberian musk bag. Buchner, in his "Repertory," has given a description of a musk bag, which coincides with

that in Dr. Göbel's possession. The weight of grain musk from this bag was 225 grains, and cost 30 thaler,—about £4 10s.

If we take a Chinese musk bag, with its partially bald surface and yellowish-brown hairs here and there cut off, and soften the same by digestion in warm water, we perceive pretty plainly that it has been subjected to artificial changes. The external skin is tender, and may be easily torn, as if it had been destroyed by partial decomposition; the hairs have either fallen off or been removed by force; indeed the longer hairs clearly appear to have been cut off.

Why do not the musk bags from China arrive as perfect as those from Russia? Because the contents have been removed and the bags refilled, as may be distinctly perceived by the circumstance of those hairs which surround the interior small opening which is found on the hairy side of the bag, immediately before the genital canal, being depressed; whilst in the Russian musk bags these small hairs are found standing obliquely, and protruding in and between the secretion. It is possible, although not at all probable, that the musk deer, which abound in Thibet, Butan, &c., may possess musk bags of a perfectly distinct character from the Russian, but no trustworthy reference or practical judge has ever witnessed the removal of such a bag from the living animal, or described it or its contents. That the grain musk of the Chinese musk bags which have been brought to Europe differs very much in its effects, as well as in its physical and chemical characters, from the pure Siberian, has been ascertained; and that it likewise acts with more energy on the living economy when administered internally. All the different chemical investigations of musk, for which we are indebted to Buchner, Wetzlar, Oberdörffer, Thiemann, Blondeau, Guibourt, Geiger, and Reimann, &c., taken together, afford very few hints in reply to those questions, which involuntarily present themselves, in refer-

ence to the two different kinds of musk, so far as regards their chemical and mercantile relations.

Taking, therefore, the most essential points of the preceding communication:—1st, that the Russian musk is always sold in perfect bags, and exported in considerable quantities to China and to London; 2d, that from China to Russia no direct exportation of musk takes place; 3d, that the Chinese musk can only be obtained via London; 4th, that the Chinese musk bags never arrive unopened; 5th, that it appears most undoubtedly that the mass has been taken out and replaced; 6th, that the external appearance of the bags proves sufficiently that they have undergone artificial treatment; 7th, that frequently the secretion, apart from the bag, is imported from China, leading to the inference that a sufficient number of bags cannot be obtained, wherein to put the quantity increased by adulteration; taking all these reasons into consideration, we think the conclusion announced at the commencement cannot be avoided, viz. that the distinctly marked difference of the Chinese from the Russian musk, if not wholly, is at any rate chiefly, caused by the treatment which it undergoes in China, and therefore that Chinese musk is the natural product after it has been modified by artificial means.

It is a fact worthy of remark, as showing the ignorance which exists in reference to the places whence products are obtained, that notwithstanding the fact that London receives the greater quantity of Russian musk, yet that in the Trades' List and Prices Current no mention is ever made of Siberian or Cabardinian musk.

In reference to the quantity of musk on which duty has been paid, we find, on referring to the Customs' official documents, that in the year 1842, up to June 28th inclusive, the duty of 6d. per oz. was paid on 1643 oz., whilst during the same term in 1841 only 501 oz. were cleared.

At the port of London alone, from June 1841 to June 1842, duty was paid on 969 oz.—*Lon. Chem. Gaz.* Nov. 1, *from Polytechnic Review*, Oct. 21, 1843.

ART. LXXVII.—OBSERVATIONS ON LEECHES.

By Otto Köhnke.

In consequence of the premium offered by the French Society for the Encouragement of Arts, in the year 1840, for the best observations on leeches, the most advantageous methods of rendering them fit for frequent use, and for multiplying them in artificial ponds, I was induced to make the following experiments:—

Every one who has had much to do with the treatment of leeches will be aware of the great trouble and care required to render them serviceable a second time. I have succeeded in making them fit for use three, four, and even five times, by a method which I am not aware has hitherto been employed. The results of my experiments I will communicate in the present article.

In these experiments different species of leeches were employed, for instance—

Sanguisuga interrupta, M. T.
Sanguisuga officinalis, Savig.
Sanguisuga medicinalis, Savig.

which are described in every good work on zoology.

S. medicinalis was obtained from Jutland, where it still occurs in plenty.

The treatment was as follows:—Each kind was kept in an open wooden jar, containing a sufficient quantity of water and some fresh plants of *Calamus*. The border was rubbed in on the interior for two inches with dilute sulphuric acid. As soon as the leeches had been employed they were thrown into a vessel in which were placed some beech-wood ashes; in a very short time they had vomited all the blood, and were then removed as quickly as possible, in order not to weaken them too much, on to a seive, and well washed; and

after having undergone this treatment they were conveyed into a vessel containing water, and coarsely-pounded, well-washed charcoal, and here left for the space of twelve hours, upon which they were removed into the above-mentioned jars.

In this manner I obtained with 180 leeches (60 of each kind) the following results:—I may observe that they were employed at intervals of from three to four weeks, from July to October of the same year.

S. interrupta.

	Leeches employed.	Number which died in the interval.	Observations.
1st time	60	7	The first time 2 would
2d "	53	31	not suck, the second time
3rd "	22	14	5, and the fourth time 3,
4th "	8		after which the remainder died within 8 days.

S. officinalis. Hungarian Leech.

1st time	60	9	The second time 3
2d "	51	37	would not suck, the third
3rd "	14	10	time 2, and the fourth
4th "	4		time 1, the remainder died within 19 days.

S. medicinalis.

1st time	60	4	The first time 1 would
2d "	56	18	not bite, the second time
3rd "	38	19	6, and the fourth time 7,
4th "	19	10	the remainder all died
5th "	3		within 5 days.

From these results *Sanguisuga medicinalis* would seem to deserve the preference, but the shortness of the transport may perhaps account for this considerable difference.

Other experiments have at the same time taught me that when the leeches are employed only at intervals of from eight to ten weeks they preserve far better.

The treatment of leeches in the manner above described would lead, especially in large hospitals, to a considerable saving of expense. It need scarcely be mentioned that this plan cannot be adopted with those which have been applied to individuals suffering from contagious diseases. For such cases I may however direct attention to the fact, that when a portion of the foot of the leech is cut off while it is sucking, the leech then, instead of removing as usual 1 or 1½ oz. of blood, will take 3, 4, and even 5 oz. Should this be confirmed, it will be possible to effect with one leech what otherwise would require two or three.

With the constantly-increasing rarity and expense of the officinal leech, it is certainly desirable to draw more attention to the horse-leech, *Hirudo vorax*, which is met with in many districts in considerable numbers.

I have also made some experiments with these leeches, and have generally obtained similar results. Thirty specimens of ordinary size were employed, and I never observed any serious inflammatory wounds, or other ill consequences, result from their use. Even were they not to be employed on the more tender parts of the body, they might still be made use of in very many cases.

I will now add some observations on the preservation and breeding of the leech, and also a word or two respecting the difficulty which sometimes occurs of bringing the leeches to bite.

With respect to the preservation of leeches, I have frequently had occasion to keep them, even in very considerable quantities, for half a year and more in pure water, in which were placed some plants of *Calamus*, renewing the water every eight days in summer, and every three or four weeks in winter. This plan I consider to be the best, especially with small quantities.

I cannot advise the use of loam, turf, or patches of grass intermingled with roots of *Calamus*, which are frequently had recourse to, as I have learned from experience that it is

not only difficult to cleanse the vessel under such circumstances, but that in doing this and replacing these substances, which must be done at least every three weeks in summer, a number of leeches are wounded and crippled.

The vessel which I employ for preserving large quantities is constructed of *beech-wood*, and is about 4 feet high and as many in circumference. In it is placed grass turf, arranged on shelves one above the other for three quarters of its height, and in a funnel-shaped form, so that the water may easily run off. It contains a false bottom, below which is a cock, with an arrangement to prevent the leeches from escaping, through which the water may be drawn off. The lid consists of a wooden frame, with varnished iron-wire net-work with rather wide meshes. The inside of this frame is moistened from time to time with sulphuric acid, which prevents the leeches from creeping on the sides of the vessel. The acid does them no harm, but appears on the contrary to prevent their dying so easily, and moreover to render them sooner fit for use. In a vessel or pail of this kind from 3000 to 5000 leeches may be kept.

With respect to the breeding of leeches, I obtained in autumn from 4000, kept during last summer in a vessel of the kind described above, about 700 young leeches.

One of the greatest inconveniences with leeches is when they refuse to bite, and although considerable attention has been paid to this subject, most of the means advised under such circumstances are attended with little success. Martius, in his 'Zoology,' mentions several, one of which I have found to do good service. As it is always to be had, it deserves to be better known. When weak beer is warmed to about 100° Fahr., and the leeches left for a few minutes in it, they suck with the greatest avidity. Those which will not suck after this treatment I have almost always found to be ill.—*Lond. Chem. Gaz., Archiv der Pharm.*

MINUTES OF THE PHARMACEUTICAL MEETINGS.

October 2d, 1843.

Professor CARSON in the Chair.

The minutes of the previous meeting were read and adopted.

Augustine Duhamel called the attention of the members to a root found intermixed with senega, in the proportion of one-third, presenting characteristics different from those of that drug, and easily distinguishable from it. As the subject possessed some interest, it was referred, for consideration, to Augustine Duhamel and William Procter, Jr.

Joseph C. Turnpenny exhibited a reddish brown ferruginous powder, deposited from a spring in New Jersey, near the Delaware water gap, together with some of the spring water. The latter has acquired a local celebrity as a remedy in diseases of the bladder. The hasty examination to which it had been submitted elicited nothing of interest in its composition.

A specimen of the reticulated inner bark of the lace tree, and one of very old oil of lemons, were presented by the same. The color of the oil was reddish brown, consistence thick and oily, odor terebinthinate, and taste disagreeable, little resembling oil of lemon. It was supposed to have been adulterated with copaiba, but the probability is greater that mere age was the cause of its present condition.

Prof. Carson informed the meeting that there was in the market a volatile oil, called "oil of cedar," and inquired if the source of it was known to druggists. It is stated to have been productive of poisonous effects when taken internally.

Wm. Procter, Jr., presented specimens of the fruits of *Mimosa scandens* and *Pisum cordatum*, from the West Indies.

November 6th, 1843.

Professor CARSON in the Chair.

The last minutes were read and adopted.

The Journal de Pharmacie et de Chimie and Journal de Chimie Medicale, to September; the London Pharmaceutical Journal to August, and Silliman's Journal for October, were received.

The Committee appointed at last meeting presented their report, which was read.

Professor Carson read a paper on an article purporting to be "Texas Sarsaparilla," but which he believed to be the stem and branches of a vine-like climbing plant. It was referred to Thomas P. James and Prof. Bridges.

A paper on the "Ergotine" of M. Bonjean, by Augustine Duhamel, was read by the Secretary, and was committed to Ambrose Smith and H. W. Worthington, as reporters.

A paper on the Gunjah or Indian Hemp of the East Indies, compiled by Augustine Duhamel, was read, and given in charge to William Procter, Jr. and John H. Ecky, for examination.

A specimen of Citrate of Iron and Quinine, prepared by Lawrence Turnbull, was presented to the meeting. It was in the form of brilliant scales of a reddish brown color, very like Citrate of Iron. Its taste is slightly chalybeate and bitter after remaining in the mouth for some time, but it is not very soluble. The following is an outline of the process for preparing it:—Make an acid citrate of quinine, by adding quinia to a hot solution of citric acid, and afterwards an equivalent quantity of citrate of iron. When the solution is complete, evaporate it to a syrupy consistence, and spread on glass to dry.

A specimen of the volatile oil of *Juniperus virginiana*, and the fruits of the *Bignonia echinata*, *Annona glabra*, and *Annona squamosa*, were presented by William Procter, Jr.

December 4th, 1843.

Professor CARSON in the Chair.

The minutes of the previous meeting were read and adopted.

The Committee having in charge the paper of Dr. Carson on Texas Sarsaparilla, reported in favor of its publication.

The paper of Augustine Duhamel on the Ergotine of M. Bonjean, was recommended for publication by the Committee.

The commission to whom the essay on "Indian Hemp" was submitted, approved of its insertion in the Journal.

A paper containing observations on cold cream, by Lawrence Turnbull, was read by the Secretary and referred for consideration to W. Procter, Jr. and Thomas P. James.

A paper, being extracts from the observations of M. Deschamps on Pommades, translated by Augustine Duhamel, was read and referred to the publishing committee.

A note from Augustine Duhamel was read, on Canchalagua, a South American remedy, brought from Monteroy by Dr. N. C. Barrabino, of the United States Navy. It is the *Erythræa Chiliensis*, a detailed account of which is given in the 6th volume of the American Journal of Pharmacy, by Dr. Joseph Carson. According to Dr. B. it occurs abundantly in Chili and California. It is much employed by the natives in fevers, particularly intermittent, and as a pleasant bitter tonic and diuretic. It is administered in the form of infusion.

Dr. Carson observed that several barrels of the Erythræa were brought to this city from South America, some years ago, by Dr. Ruschenberger, U. S. N., and employed at the navy yard of this city.

A specimen of Cucumber Ointment, made by Augustine Duhamel, was presented for examination. It is prepared by expressing the juice of the green fruit, filtering and beating it for a long time with pure lard, until the fatty matter imbibes all the odor and taste of the juice. The excess of fluid is then separated, the lard melted and preserved in well stopped vessels, covered with rose water.

William Procter, Jr., asked the attention of the members to the results of some experiments he had made on the bark of *Betula lenta.* 1st, That the volatile oil of *Betula lenta* is identical with that of *Gaultheria procumbens;* 2d, that there exists a peculiar principle in the bark, for which the name of *gaultherin* is proposed, which bears the same kind of relation to the oil of gaultheria, that amygdalin does to the oil of bitter almonds; 3d, that this principle, by boiling its solution with a fixed alkali, is decomposed, yielding a peculiar acid which remains combined with the base.

Edward Parrish presented a specimen of adulterated "Powdered Opium." He stated that it contained 3 per cent. of morphia and some meconic acid, and from its appearance probably contained chocolate.

A vial containing a few very brilliant iridescent crystals attached to its inner surface, was presented by Augustine Duhamel. It had formerly contained bisulphuret of carbon, all of which had evaporated through the cork and left the crystalline matter. Dr. Bridges suggested that it was silica.

Ambrose Smith called the attention of the meeting to a quantity of seeds which had been separated from flaxseed. Their color was deep orange yellow, and on examination proved to be the seed of an Allium, the garlic taste being very strong when they were chewed.

CORRECTION.—The leading Article in the last No. of the Journal (October,) was headed "On Hydrargyrum cum Creta, by Daniel Stewart, of Baltimore." The author is Mr. *David Stewart,* of Baltimore, so well known as a highly scientific Apothecary.

MISCELLANY.

Cyanide of Gold.—Mr. Defposses recommends to those who, in the the preparation of this substance by means of cyanide of mercury and a solution of chloride of gold, fear that some traces of the mercury might be retained with the gold, a resort to another method which succeeds equally well. It consists in submitting the hydrated oxide of gold, precipitated by magnesia according to Pelletier's method, to the contact of recently prepared and diluted hydrocyanic acid. In the first moment of the mixture the oxide of gold becomes blackish green, (constituting, perhaps, the cyanide of the oxide not yet obtained,) but in carrying the liquor to ebullition it soon takes a fine yellow tinge: all that is required then is to evaporate to dryness, by a very moderate heat, to obtain a very handsome and pure product, which needs no washing. For a cyanide of gold destined for medical use, this mode of preparation is to be preferred.—*Jour. de Pharm.*

Moxon's Magnesian Aperient.

℞ Magnes. Sulph.
Sodæ Carbon. *aa* lbj;
Acid. Tart. lbss. M.

The ingredients to be separately and well dried.

Powell's Pectoral Balsam.

℞ Rad. Ipecac. Contusæ, ℥iss.
Flor. Benzoin.
Ol. Anisi, ℥iij.
Spirit. Vin. Rectif. Olj.
Aquæ. Distill. Oj.

Macerate for fourteen days, and add—

Ext. Glycyrrhizæ, ℥vj.
Potass. Carbon. ℥iv.

dissolved in a pint of water, and add—

Tinct. Digitalis, ℥vij.

Freeman's Bathing Spirits.

℞ Lin. Saponis, ℥iv.
Spirit. Vin. Rectif. ℥j.
Tinct. Lavand. Co. gtt. xxv.
Ol. Rorismar. ʒss. M.

ROBERT WHITE.

[We insert the above on Mr. White's authority, in the belief that the formulæ are correct, although we have no means of verifying them.—*Ed. Pharm. Jour.*]

Albumen.—The albumen of eggs owes its density, and its adhesive and stringy properties, to the presence and the cohesion of a great number of minute globules. (*Turpin on the microscopic examination of the globules of milk in a pathological state.*) These globules, according to the author, are nothing else than vegetable seeds, which are capable of germinating under the influence of moisture and heat. In a philosophical point of view, the white of egg, in its crude state, may be classed among the most tender and easily digested vegetables; but it also contains, as is known, a portion of sulphur, and it is this, probably, together with the yolk, that renders eggs so salutary to many convalescents. It has been observed, among other things, that the medicinal effect of eggs is remarkably deteriorated by boiling them with any fatty matter. This effect has been ascribed to the oxidation of the sulphur. *Ibid, from Annales de Thérapeutique*, August, 1843.

New Astringent Preparation of Rhatany.—By digesting rhatany root in sulphuric ether, a brown extract is obtained, which is perfectly soluble in distilled water, and causes a powerful sensation of astringency, followed by heat and dryness, when placed on the tongue. This extract, invented by M. Tissier, of Lyons, has been employed with success in that city in passive hæmorrhages, particularly those consequent on non-contraction of the uterus, occurring after prolonged labors

and miscarriages. It has also been used with advantage for leucorrhœa, blennorrhœa, gleet, &c. The dose in which it has hitherto been employed, is a table-spoonful of a mixture composed of from five to ten grains of the extract in six ounces of some appropriate vehicle. In leucorrhœa, topical injections are recommended of from two to five grains of the extract in a pint of barly-water. The presence of this preparation in the stomach, gives rise, generally, to a sensation of heat in the epigastrium, though this rarely proceeds so far as to become painful; great thirst, and a pulse often as full as in gastritis, also prevail. These symptoms are, however, transient, and rapidly quelled by lemonade, or other mild drinks. Should the injection irritate the urethra too greatly, it is only necessary to suspend its use for a short time.—*Ibid, from Gazette de Hôpitaux* and *Lancet.*

On the Colouring Properties of Aloetic Acid. By M. Barreswill.—Aloetic acid melted with colophony becomes of an intense blue color. The author has not, hitherto, been able to extract the coloring matter; but he remarks, that the resin, thus colored blue, dissolves easily in alcohol, in the essences, and in fatty bodies—which allows of its being used for coloring these substances, and also for injections. The coloring power of the aloes blue is very considerable. A few grains of crude aloetic acid, melted with about five drachms of resin, is sufficient to color a pound of fat.—*Pharm. Jour.*

Adulteration of sulphate of potassa.—Two or three cases have been recently published in the medical Journals of the Continent, in which the sulphate of potassa, prescribed to nursing women, has proved fatal, after causing a singular series of symptoms. M. Moritz of Neufbrisach, after briefly alluding to another case, in which this salt induced very serious symptoms, states that on examination he found it contained a notable quantity of the sulphate of zinc. He observes that the sulphate of potassa of commerce sometimes contains zinc, while other specimens contain both zinc and copper. The sophisticated salt is procured from Germany, where it is the secondary product of the manufacture of nitric acid, in which the sulphate of iron has been substituted for sulphuric acid. The ferruginous salt contains a variable quantity of zinc, copper, &c., according to the sulphurets from which it has been procured. Chemists purchasing this salt, therefore, instead of preparing it themselves, should examine and purify it. *Lond. Chemist.*

Gallic acid in menorrhagia.—Professor Simpson stated, that for the last year he had employed gallic acid in some cases of menorrhagia, with the most successful results. Like all the other remedies directed against that disease, it had also occasionally failed in his hands. Some of the cases which had completely yielded under its use, were of an old standing, and aggravating description. He gave it during the intervals, as well as during the discharge, in doses of from ten to twenty grains per day, made into pills. It had this advantage over most other anti-hemorrhagic medicines, that it had no constipating effect upon the bowels. He was first induced to use it, from finding a case of very obstinate menorrhagia get well under the use of Ruspini's styptic, after many other remedies had utterly failed, and from it being alleged that gallic acid was the active ingredient in that styptic. He suggested whether the anti-hemorrhagic properties of some of our common astringent drugs may not depend upon the gallic acid as much or more than upon the tannin which they contain, or upon the tannin becoming changed into gallic acid within the body.

Dr. Douglas Maclaclan mentioned, that in one case where he had tried it without success, it had acted as a diuretic.

London and Edinburgh Monthly Journal of Medical Science, July, 1843.

Anti-Epileptic Pills.

R	Aqueous extract of opium - -	5 centigr.
	Acetate of lead - - - -	20 „
	Powder of hyosciamus - -	40 „
	Gum syrup - - - -	q. s.

M. and F. S. A., a perfectly homogeneous mass, divided into eight pills of equal size, rolled in powdered orange leaves.

These pills are prescribed by Professor Récamier in cases of epilepsy. He directs one to be taken in the morning, and the other in the evening.

We follow up this formula with that which Dr. Leuret prescribes in the same cases, and of which he has had opportunity of proving the efficacy.

R	Extract of stramonium - - -	1 gramme.
	Extract of belladonna - - -	1 „
	Camphor - - - - -	50 centigr.
	Opium - - - - - -	„

M and F. S. A., a homogeneous mass, to be divided into pills of 10 decigr.

One of these pills is taken *per diem*, at the commencement, and the dose is progressively increased, according to the effects produced, until it amounts to 15 and even 20 in the course of 24 hours.

London Chemist, from Gazette de Santé.

Ethereal Liniment of Oil of Ergot.

℞ Oil of ergot - - - - 4 grammes.
Sulphuric ether - - - 12 "

Mix and keep it in a well stoppered bottle.

This mixture is very probably more active than the following.

Ibid, from Jour. de Chim. Méd.

Liniment of Oil of Ergot of Rye.

℞ Oil of ergot - - - - 4 grammes.
Oil of sweet almonds - - - 12 "

Mix by simple agitation.

Ibid from Ibid.

Pills of Oil of Ergot of Rye.

℞ Oil of ergot - - - - 1 gramme.
Yolk of egg - - - - 1 "
Powder of mallow - - - 1 "

M. and F. S. A., a perfectly homogeneous mass, to be divided into 20 pills, which should be silvered.

Ibid from Ibid.

New Purgative Ærated Sea Water.—An apothecary of Fecamp, on the coast of Normandy, has added to Pharmacy a new preparation, which he calls *eau de mer gazeuse*. He procures sea water at some leagues' distance from the shore, and from a certain depth; this he filters, to deprive it of its animal and vegetable impurities, which prevents its keeping wholesome, and he then charges it, like soda water, with carbonic acid. The preparation thus formed has been submitted to the French Academy of Medicines, and M. Royer has reported that it is a stronger purgative than seidlitz water; that it may be taken without repugnance, and is even agreeable to the taste of some; that no inconvenience has, in his experience, resulted from its use, and that it appears to exert a favorable effect in scrofulous patients. This testimony would seem to be decided and satisfactory enough on behalf of the preparation; but, as if litigation and splitting straws were to be the perpetual characteristics of French debates, the Academy would not suffer a recommendation of the article in question to proceed from it until the word *purification* had been expunged, and the *filtration* substituted in the detail of the process by which the animal and vegetable impurities are removed from the water.—*Ibid from Gaz. Méd.*